



A STUDY ON BIO- MEDICAL WASTE MANAGEMENT USING KAYAKALP TOOL AT DISTRICT HOSPITAL IN SOUTHERN INDIA

Parvathy T Somaiah¹, Shivaraj B M²

Financial Support: None declared
Conflict of interest: None declared
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How to cite this article:

Somaiah PT, Shivaraj BM. A Study on Bio- Medical Waste Management Using Kayakalp Tool at District Hospital in Southern India. Ntl J Community Med 2016; 7(7):614-617.

Author's Affiliation:

¹Tuor; ²Assistant Professor, Community Medicine, Kodagu Institute Of Medical Sciences, Madikeri, Karnataka Mallappa²

Correspondence:

Dr. Shivaraj. B. M
bmshivaraj2005@gmail.com

Date of Submission: 03-07-16

Date of Acceptance: 20-07-16

Date of Publication: 31-07-16

ABSTRACT

Background: As a part of the Swachh Bharat Abhiyaan campaign, the Ministry of Health and Family welfare launched "Kayakalp", an initiative to promote cleanliness and enhance the quality of public health facilities. This study was conducted to assess performance of Biomedical Waste management in Government District hospital using the Kayakalp assessment tool.

Material and methods: A cross sectional observational study was conducted by using the Kayakalp assessment tool. Direct observation, Staff interview and documents review were the methods used.

Results: The assessment using the tool showed Segregation of medical waste(80%), Collection and transport (50%), Sharp management(90%), Storage of waste(50%), Disposal(60%), management of Hazardous waste(70%), Solid waste management(50%), Liquid Waste management(60%), Institutional equipment and supplies for waste management(60%) and Statutory Compliances (80%). The biomedical waste management of healthcare setting is about 57%.

Conclusion: Improvements in Biomedical waste management can be made by increasing the knowledge, awareness and practices among the healthcare workers by providing mandatory training.

Keywords: Bio-Medical waste management, Public healthcare setting, KAYAKALP

INTRODUCTION

Human health ecology is a complex phenomenon and vulnerable to changes rapidly. With rapidly developing science and technology, health is still a challenge and a priority issue among all agendas globally. Healthcare Institution is an organization where their services are utilized by people of various age, sex and ethnicity ¹. Widely use of disposables, have increased the incidence of hospital acquired infections which are attributable to inappropriate management of Biomedical waste i.e., increase generation of waste, inappropriate handling, storage and disposal of waste ².

Bio- Medical Waste (BMW) is "any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological and including categories mentioned in Schedule I (Bio- Medical Waste (Management& Handling) Rules, 1998)³.

Increasing amounts of biomedical waste is a public health concern globally drawing attention of all health authorities, organization and the government bodies. The global scenario of BMW management is shocking as it is reported 18 to 64 percent of health care settings have unsatisfactory BMW management system ⁴. According to World

Health Organization, 85% of hospital wastes are non-hazardous, 10% are infectious and 5% are non-infectious⁵. The hospital waste has a high potential for infection and risk of injuries putting in danger the healthcare workers, the patients, the community and the environment.

The burden of the problem varies for developed and developing countries. In developed countries the problem lies in the increasing volume of waste produced by increasing use of disposable items and in developing countries, where the supplies for waste disposal are limited, the problems are more related to segregation and disposal of the healthcare waste⁶. Survey has shown, the waste generation can vary on the income of the country⁷.

The Scenario in India: The gross generation of BMW in India is 4, 05,702 kg/day of which only 2, 91,983 kg/day is disposed⁸. The approximate quantity of waste generated in hospitals varies between 0.55 and 20 kg/bed/ day⁹. The Government of India, Ministry of Environment and Forests, drafted and approved the Bio-Medical Waste (Management and Handling) rules, 1998, for management of Biomedical Waste Management. The framework specifies Hospital Waste Management is a part of hospital hygiene and maintenance activities. Much of the current scenario is deviating from the law. Much of expected problems in India are poor quality of equipments for waste disposal, inappropriate segregation and improper storage and disposal⁶. The problem is much larger than expected, with lack of awareness and knowledge among the healthcare professionals¹⁰. Adequate knowledge, awareness and sound practices of healthcare waste can minimize the risk of infections and injuries¹⁰.

Kayakalp Assessment: As a part of the Swachh Bharat Abhiyaan campaign, The Ministry of Health and Family Welfare, Government of India, launched an initiative 'KAYAKALP' to promote cleanliness and enhance the quality of public health facilities. The assessment of performance of the facility is based on parameters like hospital facility upkeep, sanitation and hygiene, waste management, infection control, support services and hygiene promotion¹¹.

OBJECTIVE: Situational analysis of Biomedical Waste management in the District hospital using the Kayakalp assessment tool.

MATERIALS AND METHODS: Ministry of Health and Family Welfare, Government of India has drafted guidelines- Swachhta Guidelines for Public Health Facilities, to increase the awareness of cleanliness of healthcare facilities¹². The

Kayakalp program is an initiative of the Swachh Bharat Mission. This study is a part of the larger study conducted at the District Hospital, Madikeri, Kodagu district, Karnataka State, India. The Kayakalp Assessment tool is conducted in the hospital annually to assess the standards of healthcare practices in the hospital i.e., Hospital Upkeep, Sanitation and Hygiene, Waste management, Infection control, Support Services and Hygiene Promotion¹².

The District Hospital provides an outpatient service to almost 600 patients on a daily basis. The hospital has a total number of 410 inpatient beds with inpatient occupancy of 60% at all times. The hospital waste is generated mainly from the OPDs, injection rooms, casualty, OTs and Labor rooms.

As this a part of the National Initiative, it is currently an ongoing program in the hospital. Before this phase of the study, healthcare professionals-Medical Officer and nurses had a sensitization program organized by the Department of Health and Family Welfare, Kodagu District by the District Health Officer. Before the initiation of this phase of the study, prior permission was obtained from the concerned authorities. Consent from the District Surgeon, nursing superintendent and health administrator officer was obtained. The study was conducted in the month of August, 2015.

The cross sectional study was conducted at the District Hospital. The assessment methods used in this study were direct observation (OB), Staff Interview (SI), and Review of records and documents (RR). The scores were applied as Fully Complainant (2), partially complaint (1) and non-compliant (0). The observations and documentation were conducted using a checklist provided under KAYAKALP program.

RESULTS

Following the sensitization program, The Kayakalp Assessment Checklist audit was conducted by the staff nurses under supervision of the program coordinator. Analysis of the study showed the waste management practices in the hospital were deficit. The overall score for biomedical waste management is 64(maximum score-100).

The following study results are described in the tables. During segregation of waste, appropriate color coding was being used. Separation of infectious waste and domestic waste was followed in all working areas. All staff was aware of the segregation protocols. The waste bins were kept closed at all times. The bags were emptied when filled two-thirds.

Table 1: KAYAKALP assessment on Biomedical Waste Management

Reference No.	Criteria	Score Box	Maximum score
C1	Segregation of biomedical waste	8	10
C2	Collection and transport of biomedical waste	6	10
C3	Sharp management	9	10
C4	Storage of Biomedical waste	5	10
C5	Disposal of biomedical waste	6	10
C6	Management of Hazardous waste	7	10
C7	Solid general waste management	3	10
C8	Liquid waste management	6	10
C9	Equipment and supplies for biomedical waste management	6	10
C10	Statuary Compliances	8	10
	C1+C2+C3+C4+C5+C6+C7+C8+C9+C10	64	100

The bags were transported in closed containers. The route of transport was through the facility. Puncture proof containers were used for disposing sharps. The staff recapped needles after administering injections. All staff were aware of needle stick injuries and what needed to be done i.e., First Aid measures. Post-exposure prophylaxis kits were available in the hospital. The biomedical waste is stored in its designated area within the premises of the hospital. Disposal of Biomedical waste was mainly outsourced and the waste is cleared from the facility twice a week. All staff was aware that mercury is a hazardous substance, but most of them were not aware of the management of mercury spills. All laboratory reagents, chemicals and radiography solutions were disposed as per manufacturer's instructions. General and infectious wastes were disposed separately. Solid waste was disposed through Municipal agency on a regular basis. Laboratory samples and body fluids were treated with chlorine solution before disposal. Septic tank repairs are checked regularly. Supplies for waste disposal are provided to all workstations. There are no trolleys available for the transport of waste from the workstation to the storage area. Bio- Medical Waste (Management & Handling) Rules, 1998, a copy is available in the facility. There is a staff nurse who monitors the Biomedical Waste management in the facility. A record is maintained of the waste generated in the wards. The facility has a valid authorization for Bio-medical waste. An annual report is submitted to Pollution Control board.

DISCUSSION

BMW has a high potential to transmit pathogens and infections, it is crucial for all healthcare settings to have an adequate biomedical waste management system in place. Based on the Kayakalp assessment tool, the score of the hospital was 64%. The BMW study was performed under ten sub-sections.

Segregation of waste at its point of generation is the most crucial step for a proper management of BMW. Waste in wrong disposal bin or container can be a futile attempt in trying to put a proper BMW system in place. Therefore, every healthcare system implies to have appropriate waste disposal equipments i.e., color coded bags and bins, to be placed in appropriate places at waste generation point¹³. The score was 80%. As compared to a study conducted in a tertiary care hospital at Mumbai, the waste segregation score was 40.3%¹⁴. The score for "collection and transportation" of waste was 60%, showing deficit in the system. The poor scoring is because of no dedicated path for transportation of biomedical waste carrying trolleys. Healthcare waste should be transported to avoid stress to public and HCW. Therefore, it is ideal to have a designated BMW transportation route, manner and time in a healthcare setting¹⁵. Management of sharps has a very good score of 90 % in the hospital. World Health Organization (WHO) stated that "In unregulated environment, elaborate enterprises have grown up to divert used syringes from waste stream for reprocessing and sale back into unsuspecting markets"¹⁶. The score of "Storage of biomedical waste" was 50% and the poor scoring was attributable to biomedical waste being scored in the facility for more than 48 hours. Storage times for BMW should not exceed 48 hours in summer and 72 hours in winter^{3, 17}. The score for "disposal of Biomedical Waste" was 60%. The significant poor scoring is because of no disinfection and mutilation of waste before disposal. The aim of disinfection is to reduce or eliminate the pathogen levels in the waste to an acceptable level¹⁷. Disinfection procedure should be beginning at the generation point by using appropriate disinfectant solutions¹⁸. In the area of "management of Hazardous waste", the scoring was 70% and average scoring was due to non-availability of Mercury spill management kit and poor awareness among HCW of management of Mercury spills. Poor level scoring of 30% was observed in the area of "Solid Waste Management" and the poor scoring is at-

tributable to mixing of general and infectious waste and no waste clearance from the local municipal council. Despite of formulated policies on environmental protection, many countries in south Asian region still continue dumping in open¹⁹. Scores in the area of "liquid waste management" was 60% and relative low scoring was attributable to the absence of the effluent treatment plant/ local treatment facility for infectious liquid waste. As per the Bio Medical Waste (Management and Handling) Rules, 1998, each hospitals should have their own Effluent Treatment Plants (ETPs)²⁰. In absence of ETPs, the liquid wastes are chemically treated and disposed in sewage pipeline, connected to municipal treatment facilities²⁰.

CONCLUSION

Biomedical Waste Management plays an intrinsic role in preventing hospital acquired infections. There are a lot of shortcomings in a government hospital with respect to adequacy of funds, provision of equipments and supplies and disposing of waste. Most important of all is the knowledge, attitude and practices among all healthcare professionals. Poor knowledge on segregation and collection of waste can result putting in risk all health professionals as well as the patients visiting the hospital for treatment. Unsafe disposal or improper disposal can create community havoc and disrupt the environment ecology. All of this plays an important role in maintaining the health ecosystem and any disturbance in the system is a public health issue.

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