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Waste Management in Hospitals: An Empirical Study of Selected Hospitals

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Abstract: Managing the waste generated daily from the hospital and other health care facilities are not a new issue but it has gained importance in the recent years. Unfortunately, the management procedures and practices in many countries, not to mention those in other, less-developed, parts of the world, leave a lot to be beloved. Large hospitals are providing continuous training and education to staff members on handling of waste, proper waste segregation from risky waste to non-risky waste, safety measures to staff; infection control measures are adopted by the large hospitals against small hospitals of semi urban areas of Mysore city. Whoever it may be generated those wastes and also that of the government in keeping surveillance on them by enacting the laws, rules and regulations to punish for non compliances. Mysore is the city which has been identified as clean city and green city. Hope this identity remains for long period and longer period.

I. Introduction

The most vital problem faced by almost all urban areas in India is Municipal solid waste management. The trash, garbage, refuse and unwanted things are called as waste. It can be a solid waste or liquid waste or it can be bio-degradable or non bio-durable waste. Rapid changes in the life style of people are the main cause for huge amount of waste or trash. It can be in any form but has to be controlled or managed in a systematic way. Waste management is a biggest challenge for the society today. The waste management process consists of a series of activities in connection with the generation, collection, storage, transport and disposal of the waste generated at any source, at home, at the hospital, at a company, at an institution etc. Any kind of waste requires a proper management to avoid bad circumstances that would arise in case of mismanagement. There should be well planned system of waste management to reduce the consequence of harmful effects of improper waste management cleanliness next to godliness. Hygiene and cleanliness leads to better of the surrounding population, healthy nation contributes more for sustainable development of the economy. So it is sure that where there is a health there is development. To ensure this, there should be a proper mechanism for the waste management generated at different sources. It is the responsibility of all the citizens. Whoever it may be generated those wastes and also that of the government in keeping surveillance on them by enacting the laws, rules and regulations to punish for non compliances. Mysore is the city which has been identified as clean city and green city. Hope this identity remains for long period and longer period. In maintenances with the city cleanliness there is need to understand the future challenges, which may pose serious threat to the ecology. In this regard there is a serious need to study and understand the role of hospitals in their waste management in achieving growth and sustainability.

II. Conceptual frame work

According to united nations statistics division, glossary of environment statistics, waste materials that are not prime products for which initial user has no further use in terms of their own purposes of production, consumption and of which he or she wants to dispose. Waste may be generated during the extraction of raw materials or during the time of processing or during the consumption of final products or other human activities. Immediate measures should be taken to treat and dispose biomedical waste or else it will cause damage to the society. Bio-medical waste can be stored maximum time of 48 hrs in case due to some problem if health care or hospital wants to store it for little more time than it should take permission from local state authority by owning the entire responsibility.

III. Need for the study

Due to developments that are taking place in medical and health care field, no doubt the quality of health and life span has been increasing but at the same time quantum of waste generated from such services are also been increasing. Mismanagement of biomedical waste poses a threat to the very purpose of existence of hospitals.

IV. Literature Review

Shahida Rashee in the article title Hospital waste management in the Teaching of the Karachi has mentioned that hospitals should give prior importance to managing of waste than on technology, to keep the healthy

environment need to manage effectively. The hospital waste management guidelines enacted on 7th June 2004 should be followed and regulated.

M. Tsakona, E. Anagnostopoulou, E. Gidaracos “Hospital waste management and toxicity evaluation: A case study” has mentioned that Hospital waste management is an essential ecological and public safety issue, due to the waste’s infectious and hazardous character. This paper examines the existing waste policy of a typical hospital in Greece with a bed capacity of 400–600. The segregation, collection, packaging, storage, transportation and disposal of waste were monitored and the observed problematic areas documented

Nosheen Arshad, “Hospital Waste Disposal: A Review Article” study says that awareness of proper waste management training has to be provided to the employees on a continuous basis, there is a lack of technology support to manage the waste logically.

V. Objectives of the study

- To study the need and significance of waste management in hospitals.
- To calculate average waste produced in each hospital.
- To examine present waste management system of the selected hospitals.
- To study the need for the health and safety programmes for employees involved in waste management.

VI. Hypothesis

There is a positive relationship between the size of the hospital and the level of importance given to waste Management.

There is a positive relationship between the location of hospital and the level of importance given to waste Management.

VII. Research Methodology

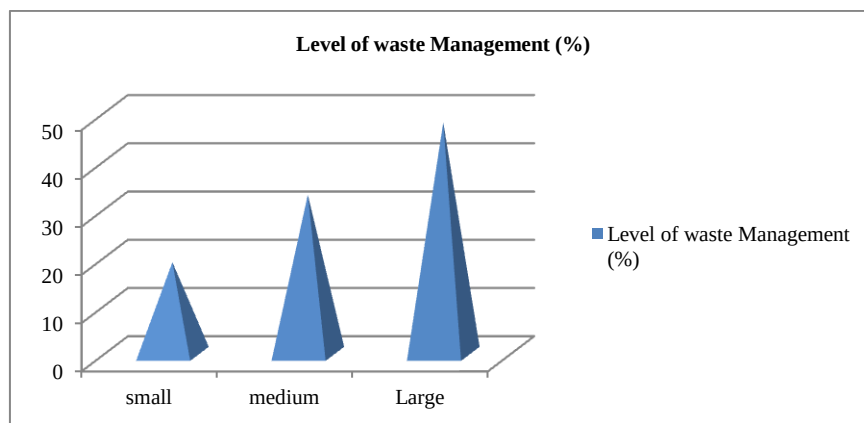
The study included eight hospitals situated at the heart of the Mysore city and rural areas of the district. The random sampling method is used for choosing Hospitals. The target respondents included Nurses, Medical Superintendents, Doctors, Sanitary Supervisors, cleaners, administrative heads. Kannada and English language were used for better communication while interviewing. The primary data collected by personal interview and through observations. Data analysis tools include tabulation, averages, percentage analysis, and charts for hypothesis testing.

VIII. Data Analysis and Findings

Hospitals have not mentioned about their corporate social responsibility in their vision statements but one can find out from their general practices adopted for day to day transactions. 34% of the hospitals mentioned about corporate social responsibility in their vision statement but many hospitals even big in size have not mentioned in the vision statement but inculcated in their practice, as per the study it shows that many hospitals lagged in waste handling areas, there is a need for waste handling and managing it. Maximum hospitals have an idea and knowledge of waste generators but not managers.

H1: There is positive relationship between size of the hospital and level of importance given to the waste management.

Size of hospital	Level of waste Management (%)
small	19
medium	33
Large	48
Total	100



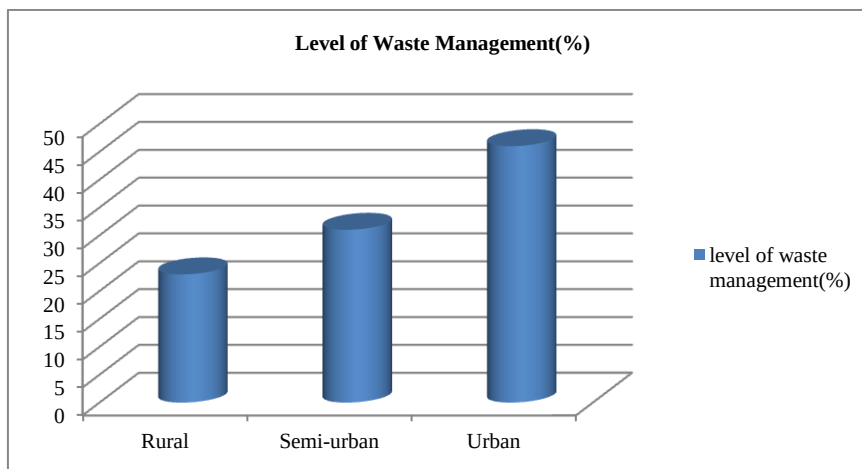
Source: Primary data

Inference:

It's a clear indication that there exists a positive relation between size of the hospital and level of importance given to waste management. In the large hospitals there will be separate department for waste management and proper repeated training will be provided to employees in handling it, but in case of generation of waste in small and medium sized hospitals are relatively less in the same time scope for handling the waste in hospitals are also less.

H2: There is a positive relationship between the location of hospital and the level of importance given to waste Management.

Location of Hospitals	Level of Waste Management (%)
Rural	23
Semi-urban	31
Urban	46
Total	100



Source: Primary data

Inference:

Awareness about handling the waste, managing it in a appropriate way can be seen more in urban areas than rural and semi urban places. It is a clear indication that location of the hospital and level of importance given to the waste management are positively correlated.

Impatient treatment, consultation for out patients, laboratory, and dispensary are the major services provided by the hospitals to the public. Most of the hospitals do not maintain the track record of waste generators in each units and it is difficult to get the exact track record of waste generators from different health care centres. Waste generated (Bio-medical waste) &(General Waste) by the OT in health care centers and in Hospitals range between 0.40-1.20 kgs/day/bed.

Average waste generated in hospitals/day/bed (in kgs)

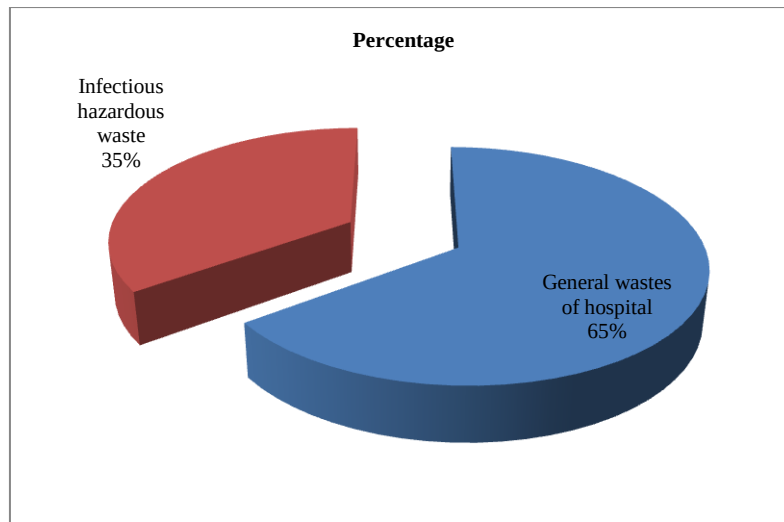
Type of waste	Minimum	Maximum
Biomedical waste	0.20	0.80
General waste	0.20	0.40
T0tal	0.40	1.20

Source: Primary data

Waste segregation is very essential task of the hospitals. There are mainly two types of hospital waste they are risk leading waste and non-risk leading waste. The process of segregation (separating risk waste from non-risk waste) has to be done at the source to minimize the injury or chances of infection. The person or group of people is to be trained properly for segregating the waste in a systematic way. Waste segregation techniques are followed by majority of the large hospitals. Techniques are colour coding and labeling.

Type of Wastes	Percentage
General wastes of hospital	65
Infectious hazardous waste	35

Source: Primary data



Around 80% of the hospitals follow colour coding to segregate the wastes in the hospitals. Different colour bins are used in the hospitals. Red and white are generally used colours to segregate the wastes. White color coding is for general waste and red is for hazardous infectious wastes. All the hospitals need to follow colour coding to segregate hazardous waste from general waste as per the Bio-medical waste rules guideline (1998). This method would help the handlers to avoid the mistakes. Efficient handling of waste in the hospital is an indication of proper training to waste handlers in the organization. Puncture proof cans were used in the major hospitals to carry sharps. Infection Control measures are adopted to put off cross or infection contamination between patients and staff. Changes in infection control and advances in technology have resulted in the increased use of disposable medical products, which have in turn increased waste treatment/disposal volumes. When clinical waste is appropriately handled and contained through good work practice and the use of protective apparel, the risk of infection is minimized. It is essential to correctly segregate waste to ensure that safe work systems protect all workers. The most significant risk associated with clinical waste is transmission of a blood borne virus from a needle stick. The harmful impacts on the environment of augmented disposable items have incorporated pollution and the reduction of non-renewable natural resources. The adoption of waste minimization practices should reduce environmental deprivation, without compromising Infection control standards.

Segregation can be achieved best all the way through

- Providing education and training programs to all staff that generate waste.
- Establishing identifiable Colour coding, labelling, postures.
- Provide suitable containers in suitable locations.
- Incorporating fast, well-organized waste disposal methods into patient care measures.
- Mobile Garbage Bags and trolleys should be used while transporting waste to decrease spills, minimize collector contact with waste and minimize manual handling. Loads contained in trolleys should be less than 50kgs.

Trolley after the usage should be rinsed in cold water and should wash in hot water, drained and left for dry and waste water may only be sidetracked to the sewer. Waste management is the responsibility of all the employees and employers of the organization. Detailed and appropriate training is needed for waste generators as well as waste handlers in the organization. Specific training on waste management helps to avoid the injuries as well as minimize the risk. Education and training should be given to employees during the time of induction. Awareness programmes should be conducted in the organization about the uses and risks of waste management and mismanagement.

IX. Findings

- Effective waste management can be seen in large hospitals against medium and small hospitals of the city.
- Awareness about the handling the waste and proper management is more in urban areas.
- Conclusion.
- Waste generation in hospital is 0.40-1.20 kgs/day/bed.
- Out of total waste generation 65% comprises general and non hazardous waste and 35% comprises hazardous waste.
- Infection control measures are adopted.

- Color coding system is adopted in majority of the hospital to segregate the biomedical waste from general waste.

X. Suggestions

- Employees who involved in generation of waste need to be educated on the consequences of improper waste management in the small and medium hospital, this work can't not be done overnight, continuous training and motivation from the management is required.
- Biomedical waste or risk involved waste has to be segregated from the general waste to avoid the life threat.
- It is a collective effort of the each individual of the organization, to promote the public health.

XI. General suggestions

- Organizations should develop strong policies and procedures on waste management.
- Develop an infrastructure for the safe disposal and recycling.
- Hospitals/Organizations should concentrate and take decisions in investing on waste management equipment and technologies.
- Ensure workers safety through continuous education on waste management and handling the equipments.
- Provide secure collection of waste and safe transportation.

XII. Conclusion

Proper collection and segregating of waste is a preliminary and utmost important task of the organization. In the hospital segregation of biomedical waste is very essential since there is no much information on medical waste management technologies. Arrangement of proper training programmes both for urban and rural hospital staff and health professionals are essential. Mainly for the better health of the society hospital need to manage the waste.

Annexure

Visited hospitals are categorized based on

No of beds in the hospital	Type of hospital
Less than 50	Small
50-100	Medium
More than 100	Large

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