

Problems in the Implementation of Biomedical Waste Management Programme at Government Medical College Hospital, Thiruvananthapuram – A Qualitative Study

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ABSTRACT

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Background: With infectious diseases like HIV and Hepatitis B wreaking havoc, hospital waste can be a serious public health threat. In spite of the various measures taken by the authorities at Medical College Thiruvananthapuram, it was observed that the hospital waste management system was not operating effectively. This study was conducted with the purpose of understanding the problems and difficulties that prevented the effective implementation of a hospital waste management system at MCH, Thiruvananthapuram.

Objectives: 1. To understand the existing practices of hospital waste segregation, transport and disposal at Govt Medical College Hospital, Thiruvananthapuram; 2. To understand the awareness and attitude of different categories of hospital personnel regarding biomedical waste management; 3. To identify the problems and difficulties encountered during the process and to identify potential solutions for the problems.

Methodology: This study was done using the qualitative method. In-depth interviews and focus group discussions were conducted among the Key Stakeholder categories, which included the Hospital Superintendent, Heads of the Departments and Faculty members, Junior Doctors, Nursing staff, Attenders and Waste movers and Disposers. Direct observations were made. Data analysis included transcription and translation of audio recordings, coding, unitising, domain identification, summarising and report writing.

Results: Knowledge was found to be sufficient. Waste minimization was unsatisfactory. Waste Management Infrastructure was not sufficient. Manpower was not adequate. Segregation of wastes was poor. The nursing staff and auxiliary staff did the segregation more or less correctly. But the junior doctors and house surgeons did poorly. Grade II workers manually sorted the waste which has been already deposited in the bins. Many disposal methods were inappropriate. Bystander control was poor.

Keywords: Biomedical Waste Management, Hospital Waste, Universal Precautions, Waste Segregation, Qualitative Methods

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INTRODUCTION

With the rapid mushrooming of healthcare institutions all over the world, the last decade or so saw the issue of hospital waste management assuming enormous public health significance.¹ Also with infectious diseases like HIV and Hepatitis B wreaking havoc, proper disposal of the wastes generated in hospitals have come to be an important measure in the direction of averting biological hazards. With this in view, the Government of India formulated the Biomedical Wastes (Management and Handling) Rules in 1998 under the Environment Protection Act, clearly stating the various measures that need to be taken during the generation, handling and disposal of biomedical wastes.² The Pollution Control

Boards of the states are vested with the authority to ensure implementation of the rules.

In India about 75% of health infrastructure, medical manpower and other health resources are concentrated in urban areas where 27% of the population lives.³ A clear exception to this generalization is the state of Kerala where not only are the health facilities more evenly distributed but also the overall health standards are at par with that of developed countries. The state also boasts to have the largest health infrastructure in the country with over 26% of the total number of hospitals in the country being in Kerala. In Kerala, the state Pollution Control Board has been taking stringent measures in this direction for quite a time

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now.^{4,5} Medical College Thiruvananthapuram is a huge institution, the biggest of its kind in Kerala, in terms of patient turnover.⁶ In spite of the various measures taken by the authorities at Medical College Thiruvananthapuram, it was observed that the hospital waste management system was not operating effectively.^{7,8} This study was conducted with the purpose of understanding the problems and difficulties that prevented the effective implementation of a hospital waste management system at MCH, Thiruvananthapuram.

OBJECTIVES

1. To understand the existing practices of hospital waste segregation, transport and disposal at Govt Medical College Hospital, Thiruvananthapuram.
2. To understand the awareness and attitude of different categories of hospital personnel regarding biomedical waste management.
3. To identify the problems and difficulties encountered during the process and to identify potential solutions for the problems.

METHODOLOGY

This study was done using the qualitative method.^{9,10,11} The Focus of Enquiry^{12,13} was 'to understand the problems and difficulties in the implementation of the biomedical waste management programme at MCH Thiruvananthapuram.'

The design used was the Emergent Research Design, which means that data collection and data analysis are simultaneous and on-going activities that allow for important understandings to be discovered along the way and then pursued in additional data collection efforts. In an emergent design, not all the specifics of the study can be outlined in advance. Important leads are identified in the early phases of the data analysis and pursued by asking new questions, observing new situations or previous situations with a slightly different lens. This broadening or narrowing of what is important to study and the consequent sampling of new people and settings is anticipated and planned for in this design.

The study period was six months, from December 2004 onwards. In-depth interviews¹⁶ and focus group discussions¹⁷ were conducted among the Key Stakeholder categories, which included the Hospital Superintendent, Heads of the Departments and Faculty members, Junior Doctors, Nursing staff, Attenders

and Waste movers and Disposers. Audio recording was done wherever possible. Also, direct observations of the activities of some of the stakeholders were made unobtrusively, to study their waste management behaviour. The steps in data analysis included transcription and translation of audio recordings, coding data pages to their sources, unitising of data, domain identification, coding of domains, summarising and report writing.^{18,19}

OBSERVATIONS

Findings of Direct observations

The direct observations were done by visiting the hospital and its premises to assess the infrastructure facilities available, the practices of people etc.

Infrastructure

The infrastructure in the hospital pertaining to biomedical waste management was assessed by direct observation. The findings were as follows:

1. Almost all wards and waste generation points were provided with colour coded buckets and bags. At certain points bags were not seen and the waste was put directly in to the bin.
2. Multi-colored display boards were placed at almost all waste generation points clearly indicating the buckets into which each type of waste is to be put.
3. The green bin was used for non-hazardous general wastes like office wastes, food wastes, medicine covers, carry bags, syringe and needle covers etc. The yellow bin was used for hazardous materials like used cotton, gauze, dressings, paddings, anatomical parts and pathological specimen, rubber gloves and catheters, plaster cast, face masks etc. which are easily degradable by burning. The blue bin was used for all hazardous materials that could be recycled, after sterilization or disinfection. All plastic materials fall in to this category. The white bin was for sharps. The red bin was for laundry and the black bin for discarded medicines.
4. Wastes were taken from the wards to the temporary storage stations mostly in wheelbarrows. Most of these wheelbarrows were in rather dilapidated conditions.
5. The temporary waste storage station was in good shape and was well maintained. There were separate rooms for each category of wastes.
6. There was a deep concrete secure pit for depositing sharps, adjacent to the storage station.

7. The contaminated plastics were treated rather unscientifically by immersing in bleaching powder solution. No shredding was carried out, as there was no shredder.
8. The incinerator for the hospital was a decrepit antique of very poor capacity, running (not running most of the times) on electricity.
9. There was no wastewater treatment facility. All wastewater went in to the public drains.
10. There was a dumping yard beyond the college playground where the general wastes were dumped.

Practices

The observed practices in the hospital were as follows:

1. Waste minimization was not a thing that the work force were really concerned about. There were many observed incidences where medical materials were used for non-medical and personal purposes, like drinking IV fluids, using fresh needles as paper clips and cloth pins and using fresh IV sets for tying things.
2. Segregation was done very poorly. The nursing staff and auxiliary staff did the segregation more or less correctly. But the junior doctors and house surgeons did not seem to be concerned at all about the segregation process. It was very difficult to find a bin containing only materials that really belonged to it.
3. A very unfortunate practice that could be noticed was the grade 2 workers manually sorting the waste wearing ordinary surgical gloves before taking the waste to the storage station.
4. The wastes were stored in the temporary waste storage station in colour-coded rooms.
5. The plastic wastes were treated in bleaching powder solution without shredding. These wastes are eventually auctioned off.
6. The sharps were dumped into deep concrete secure pits.
7. The yellow bin wastes were incinerated whenever possible.
8. The general wastes were dumped beyond the college playground until recently. Now they are carried away by the corporation.
9. Training of staff goes on from time to time.
10. A liaison officer for biomedical waste management who is a senior health inspector co-ordinated the biomedical waste management activities.

Observations from Interviews and Focus Group Discussions

The Hospital Superintendent agreed that the management of hospital waste at MCH is not up to the mark due to variety of reasons. He said that there was poor awareness among the public regarding the importance of the problem. On the infrastructure facilities available he said that things are somehow made to get along. He said that even though they had excellent storage facilities and coloured bags and bins were available in sufficient numbers, there was shortage of staff for the handling of the waste and for their supervision. He said that the hospital needed a better incinerator and proper facilities for chemical disinfection.

The House Surgeons admitted that they were very reluctant in properly executing their role in the waste management process. When asked to rate their own performance with regard to biomedical waste management on a scale from 0 to 100, most house surgeons rated themselves around 60. On the guidance they received from their teachers and other faculty members, they said they never received any guidance. Almost everyone was of the opinion that training regarding biomedical waste segregation should begin in the 3rd year itself. Also many participants said that more than one session of training should be there. Many of them thought that daily ward orientations are better than once in a while training lectures. On the issue as to who should be given the charge of ensuring segregation in ward, most of them said that it should be a medical officer.

The Nursing staff claimed to be doing most of the activities that generated hospital waste. Almost all of them said that they took utmost care in the disposal of the wastes. On a question as to how they would rate their own performance with regard to biomedical waste management on a scale from 0 to 100, almost all of them gave a score of above 80. An important area of concern for the nurses was the lack of proper infrastructure facilities and the shortage of staff. According to them almost everything needed for proper waste management, from coloured covers to transportation facilities were in short supply. Almost all of them said that the house surgeons and PGs are the most irresponsible among the hospital staff as far as waste management is concerned. Another very important problem area they identified is the plight of the Grade II workers. All the mixed up wastes that are in the bins were manually separated by the Grade

II workers before they took it to the storage station. Apathetic attitude from the senior doctors towards the waste management process was a major problem that many of the nurses brought to notice. To solve the problems with the junior doctors they recommended the involvement of the Heads of the departments and other senior faculty members.

None of the **Senior Doctors** who were approached gave an interview. They all had some excuses or other, the most common being the lack of time.

The Health Inspector and Liaison Officer for hospital waste management said that the most important problem was the ineffective segregation process. He said that the brunt of this problem is borne by the lowest grade workers who had to manually sort these wastes before taking them to the waste storage station. Poor infrastructure is another important problem he mentioned. The non-availability of a good incinerator, a shredder, an autoclave, wheelbarrows and sometimes even consumables like coloured bags, was really hampering the waste management program. Regarding accidents with biomedical wastes he said that doctors and nurses are taking the preventive measures immediately. The Grade II workers had a good chance of getting the needle pricks but they were not reporting it. He said that there should be an accident management protocol. He was of the view that the problems with the attitude of junior doctors could be solved by creating more awareness and by involving the senior doctors in their supervision.

The **Grade II workers** said that the most important problem, they had was the improper segregation of waste by other staff members. Because of this, they had to separate the waste manually. And when they were doing this they often got needle pricks and other injuries, which they said was causing much problems to their health. Most of them said that if everybody who generated the waste put the waste in the correct container, then they would not have to sort the waste manually. Another important problem that most of them identified was that they do not have enough infrastructure facilities for carrying out their work. They said that they have to do their work without having even the basic facilities, such as gloves and masks. Most of them suggested that the waste storage station should be open for a longer period of time so that people of each shift can take their own waste in their own time. This would make each shift people to take their own responsibilities. Many of them suggested that they should get periodic health checkups and preventive treatment. Some of them suggested that the problems

with the bystanders could be solved by educating them through the mass media or by installing television sets in the wards through which education programmes can be shown.

DISCUSSION

The Infrastructure status of Medical College, Thiruvananthapuram as far as biomedical waste management is concerned was far from satisfactory. Some very important equipment like a proper incinerator, an autoclave for disinfection and a shredding machine are lacking. Also we do not have proper wheelbarrows, trolleys and vehicles for transportation of the waste. Very often consumables like coloured bags, gloves etc. were also in short supply. The first and foremost step towards rectifying the problems of biomedical waste management in the hospital would be to make available all the required infrastructure facilities.

The lack of sufficient manpower was another very important problem faced by the biomedical waste management system in the hospital. This was especially so with the nursing and auxiliary staff who carry out the major chunk of the biomedical waste management activities in the hospital. So manpower expansion should be considered, as a high priority need.

The junior doctors have a poor attitude towards the hospital waste management program. For example the house surgeons who were given proper training regarding biomedical wastes segregation were the poorest performers as far as the segregation process is concerned. This is because they think that it is not part of their duty to do the segregation process correctly. One reason for this could be that the house surgeons do not feel subordinated to the head nurse who is in charge of hospital waste management in the wards. Since the head nurse do not have any power to take corrective measures over the house surgeons, they get away with whatever manner of segregation they follow. At the same time the nursing staff and the auxiliary staff who are directly under the administrative control of the head nurses do it properly because they are answerable to them. This problem can be solved, if the senior doctors like the unit chiefs under whom the house surgeons are working are given the charge to scrutinise the waste management activities of the house surgeons and take corrective measures at the recommendations of the head nurses.

A very important administrative measure that needs to be taken is the formulation of a biomedical Waste Management Policy for the hospital. This should

include the following clauses:

1. Waste minimisation: It should be aimed at advising all personnel to refrain from all kind of activities that would unnecessarily generate hospital waste.
2. Waste segregation: It should be made mandatory that any waste generated by any personnel at any point of time, should promptly be put in to the respective bin for that waste, by that individual at the point of generation itself. Also, any touching or handling of waste that has been already deposited into a bin, by any individual, should be absolutely prohibited. There should be provision for taking corrective measures against defaulters.
3. Treatment and disposal protocol: There should be a protocol outlining the method of transportation of the waste, reception and storage of the waste in the waste storage station, processing and treatment of the waste and final disposal. The waste storage station should be open for receiving waste throughout the day. Auctioning off, of the recyclable waste should be done only after sufficient mutilation and disinfection.
4. By-stander control: There should be a clear policy regarding the entry and conduct of bystanders inside the hospital. The number of bystanders who can stay with the patient should be strictly restricted to one. Visiting hours should be strictly maintained. The number of visitors per patient per day should also be restricted. The items that bystanders and visitors can bring into the hospital should be clearly outlined and monitored.
5. Accident Protocol: Clear-cut procedures for the management of accidents involving biomedical wastes should be formulated in accordance to the WHO recommendations.

The Hospital Waste Management Committee should be reconstituted as per the recommendations of the WHO, by including the hospital superintendent, the nursing superintendent, the heads of departments, the head nurses, representatives of junior doctors, the health inspectors, laboratory heads, store superintendent, chief pharmacist and representatives of the auxiliary staff. The members of the committee should have the responsibility to monitor and coordinate the activities of individuals coming under their purview. They should also have the power to take corrective and disciplinary action whenever required.

The situation of the Grade II workers having to manually sort the already 'segregated' waste, risking

their health and well-being, is a serious human rights issue. This can be avoided if all other categories of workers execute their responsibilities properly.

Every individual working in the hospital should be aware of and carry out the methods of Universal Precautions astutely. Every individual working in the hospital should be fully immunised against vaccine preventable diseases like Hepatitis B.

END NOTE

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