BIOMEDICAL WASTE MANAGEMENT

J.P HOSPITAL BHOPAL

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BIOMEDICAL WASTE MANAGEMENT: EXISTING KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING BIOMEDICAL WASTE MANAGEMENT AMONG HEALTHCARE PERSONNEL IN JAI PRAKASH DISTRICT HOSPITAL, BHOPAL (M.P)

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INTRODUCTION

- The present situation of biomedical waste management in India is gloomy, therefore after 1998 amendment rules; Government of India made it a mandate for all the healthcare facilities to abide by the rules and guidelines for safe and sustainable Biomedical Waste Management.
- It is not only the duty of the people working in the hospitals, pharmacies or clinics but it is the duty of each and every citizen of India to understand and be aware about safe disposal of biomedical waste.
- Healthcare facilities are responsible for any waste which is generated within the facility and are also responsible for segregation, collection, in house transportation, pre-treatment of the waste and storage, before such waste is collected by common bio medical waste treatment facility operator (CBMWTF)

INTRODUCTION

- Biomedical waste has become a worldwide problem and In India also; it has started to gain attention as the waste not only affects the people working in Healthcare facilities but also the Environment and the people surrounded by the facilities.
- Injuries can occur from the sharps disposal if not properly handled; then again, patients with poor immunity systems can become infected with the hospital wastes if disposal is not properly implemented.
- Risk of infection is greatest amongst waste handlers and the general public who live in the vicinity of such landfill areas where such wastes are disposed.
- Hence, separate handling of the different category of wastes is important with color codes and proper training of hospital staff to ensure proper disposal and treatment of hospital wastes.

LITERATURE REVIEW

- The study carried out in a district of Madhya Pradesh to find the level of awareness and practices related to biomedical waste management in both urban and rural health facilities in district Gwalior during the period of Jan –Jun 2008. This study was a cross sectional study in nature aimed to find out the awareness among medical, paramedical and non medical staff in the hospitals having indoor care facility. Results indicated that awareness was highest among the doctors followed by paramedical and then non-medical staff and practices were not good especially in rural areas. (January 2011, Research Gate).

LITERATURE REVIEW

- According to Biomedical waste management rules 2016, every hospital and healthcare facility has to set up a treatment plan for degradation of biomedical waste as the untreated waste cannot be stored for more than 48 hours. In this paper, they tried to explain the consequences of improper handling of the waste and also provided a glimpse of disposal and treatment methods in Ujjain and also explained the process flow of Biomedical Waste Management System.

LITERATURE REVIEW

- A KAP study was conducted in Trauma centre in 250 bedded Lucknow Medical Institute to assess Knowledge, attitude and practice among doctors, nurses, and paramedical staff from patient care centers with the help of structured questionnaire. Despite all the efforts in the field of proper waste management, still many Indian Hospitals have not achieved the desired outcomes.
- Observations showed that there is a gap in Knowledge, attitude and practices among healthcare personnel regarding biomedical waste disposal. Medical professionals have a narrow vision towards biomedical waste management which resulted in rigid attitude of not paying attention. Thus this paper suggested that proper orientation programmes is mandate and also motivation and change of mindset is required in doctors for successful implementation of practices. This study has its own limitations a sample size is small to generalize the findings and there is a limited literature available for the same type of study on doctors and nurses in Developing Countries.
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RESEARCH QUESTION

- What are the existing knowledge, attitude and practices regarding Biomedical Waste Management among healthcare personnel in J.P. Hospital?

RESEARCH OBJECTIVES

1) To determine knowledge and practices among healthcare personnel regarding Biomedical Waste Management
2) To assess attitude among healthcare personnel regarding Biomedical waste Management

METHODOLOGY

- **Study area:** Jai Prakash District Hospital Bhopal
- **Study Period**: 4 February 2019 to 6th May 2019

- **Study Design**: Cross sectional study
- **Study population**: Healthcare Personnel working at J.P Hospital (Doctors, nurses,Lab technicians, Class IV)
- **Inclusion criteria**: Healthcare personnel who have experience of 1 year in J.P.Hospital and who has given the written informed consent
- **Exclusion Criteria:** Healthcare personnelwho have less than one year of experience in J.P. Hospital and who has not given written informed consent.
- **Sampling**: Purposive sampling (based on the availability)

METHODOLOGY

- **Data collection method**: face to face interviews and observation of practices
- **Data collection tool:** Structured questionnaire and observations based on checklist
- **Data analysis:** MS Excel and SPSS 22 were used. Descriptive statistics were used for the analysis including frequencies and percentages. All the questions in knowledge and practice part were taken in consideration and percentages and frequencies were calculated. Likert scale was used to analyze the attitude among the personnel

Distribution of Participants with respect to their designation is described in the table no. 1

Category	Respondents	% Distribution
Doctors	12	15.6
Nurses	27	35.1
Lab technicians	17	22.1
Class Iv	21	27.3
Total	77	100.0

RESULTS

Correct responses for questions on knowledge regarding Biomedical waste Management

Objective of questions	Doctors (n=12)	percentage	Nurses (27)	percentage	Lab Technicians(17)	percentage	Class IV (21)	percentage	Total (77)	percentage
Knowledge about Biomedical Legislation	8	66.67	12	44.44	11	64.70	4	19.04	35	45.45
Awareness about importance of BMW legislation, segregation and generation	12	100	26	96.29	17	100	16	76.19	71	92.20
Knowledge about infectious waste	7	58.33	5	18.51	7	41.11	1	0.04	20	25.97

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Knowledge about infectious waste	7	58.33	5	18.51	7	41.11	1	0.04	20	25.97

Importance of Hypochlorite solution	12	100	24	88.8	15	88.23	16	76.1	67	87.01
Recognition of biohazard symbol	9	75	26	96.29	12	70.58	20	95.23	67	87.01

Awareness about treatment of Liquid water waste	7	58.33	15	55.55	7	41.17	8	38.09	37	48.05
Awareness about Incinerator facility	7	58.33	4	14.81	1	5.88	4	19.04	16	20.77
Knowledge about biomedical team	12	100	23	85.18	16	94.17	11	52.38	62	80.51

Correct responses for questions on Practices regarding Biomedical waste management

Objective of questions	Doctors	%	Nurses	%	Lab Technicians	%	Class IV	%	Total	%
Color coding segregation is important at point of generation	12	100	27	100	11	64.70	12	57.14	62	80.51
Importance of reporting related to injuries in BMW	12	100	25	92.59	14	82.35	16	59.25	67	87.01
Importance of Training programmes	12	100	21	77.78	14	82.35	11	64.70	58	75.32
Importance of training programmes	10	83.33	14	51.85	6	35.29	12	57.14	42	54.54

Immediately discarding the used sharp needles, syringes and slides	12	100	27	100	7	41.17	17	80.95	63	81.18
Preparation of Hypochlorite solution	7	58.33	27	100	17	100	15	71.42	66	85.71
Importance of records	7	58.33	27	100	14	82.35	5	23.80	53	68.83
Importance of PPE	12	100	27	100	13	76.47	21	100	73	94.80
Informing the BMW Committee about untreated waste	12	100	27	100	17	100	16	76.19	72	93.50
awareness of Hepatitis B vaccination	12	100	27	100	15	88.23	10	47.61	64	83.11
Awareness of Tetanus Vaccination	12	100	27	100	17	100	15	71.42	71	92.20

S.No	Attitude questions
1	. Safe Management of Biomedical Waste is not an issue at all:
2	Waste Management is a team work
3	Safe Management efforts of Biomedical Waste increase the financial burden on management
4	Importance of training of Healthcare Personnel regarding BWM practices
5	Vaccination against Hepatitis B , Tetanus are important
6	Significance of putting the waste in assigned containers

Distribution of responses from the item Safe Management of Biomedical Waste from likert scale

	Frequency	Percent
4 strongly agree	7	9.1
3 agree	7	9.1
2 disagree	35	45.5
1 strongly disagree	24	31.2
0 no comment	4	5.2
Total	77	100.0

Safe management of biomedical waste is not an issue at all:		Designation				Total
		Class iv	doctor	LT	Staffnurse	
	4 strongly agree	4	0	1	2	7
	3 agree	4	0	1	2	7
	2 disgaree	4	0	13	18	35
	1strongly disagree	5	12	2	5	24
	0 no comment	4	0	0	0	4
Total		21	12	17	27	77

Distribution of responses from the item Safe Management efforts of Biomedical Waste increase the financial burden on management on likert scale

	Frequency	Percent
4 strongly agree	7	9.1
3 agree	28	36.4
2 disagree	20	26.0
1 strongly disagree	17	22.1
0 no comment	5	6.5
Total	77	100.0

Safe Management efforts of Biomedical Waste increase the financial burden on management	Designation				Total
	Class iv	doctor	LT	Staffnurse	
4 strongly agree	0	6	1	0	7
3 agree	8	0	11	9	28
2 disagree	5	1	1	13	20
1 strongly disagree	3	5	4	5	17
0 no comment	5	0	0	0	5
Total	21	12	17	27	77

Distribution of responses from the item waste management is a team work on likert scale

	Designation				
	Class iv	doctor	LT	Staffnurse	Total
4 strongly agree	6	12	7	13	38
3 agree	15	0	8	13	36
2 disagree	0	0	1	0	1
1 strongly disagree	0	0	1	1	2
Total	21	12	17	27	77

Distribution of responses from the item waste management is a team work on likert scale

	Frequency	Percent
4 strongly agree	38	49.4
3 agree	36	46.8
2 disagree	1	1.3
1 strongly disagree	2	2.6
0 no comment		
Total	77	100.0

Distribution of responses from the item Importance of training of Healthcare Personnel regarding BWM practices on likert scale

	Frequency	Percent
4 very important	63	81.8
3 important	14	18.2
Total	77	100.0

Distribution of responses from the item importance of training of Healthcare Personnel regarding BWM practices on likert scale

		Designation				
		Class iv	doctor	LT	Staffnurse	Total
	4 very important	12	12	15	24	63
	3 important	9	0	2	3	14
Total		21	12	17	27	77

Distribution of responses from the item Vaccination against Hepatitis B , Tetanus are important on likert scale

	Frequency	Percent
4 strongly agree	52	67.5
3 agree	25	32.5
Total	77	100.0

Distribution of responses from the item Vaccination against Hepatitis B , Tetanus are important on likert scale

	Designation				Total
	Class iv	doctor	LT	Staffnurse	
4 strongly agree	11	12	9	20	52
3 agree	10	0	8	7	25
Total	21	12	17	27	77

Distribution of responses from the item Significance of PPE in Handling of Biomedical waste on likert scale

	Frequency	Percent
4 very significant	51	66.2
3 significant	26	33.8
Total	77	100.0

Distribution of responses from the item Significance of PPE in Handling of Biomedical waste on likert scale		Designation				
		Class iv	doctor	LT	Staffnurse	Total
	4 very significant	11	7	13	20	51
	3 significant	10	5	4	7	26
Total		21	12	17	27	77

PROCESS OF BIOMEDICAL WASTE MANAGEMENT IN HOSPITAL

Segregation

- Segregation is at the point of generation .
- Biomedical waste and general waste are kept separated, color coded bins are followed properly.

Collection

- Biomedical waste and general waste both are colected twice in a day, one in morning and the other time in the night . Waste is collected at the particular time from each ward
- Green color trolleys are used for collection and most of the collectors use PPE kit while handling

pretreatment

- Gloves, linen are pretrated in hypochlorite solution before throwing them.
- Syringes are soaked in hypochlorite solution

Intramural transport

- Transport of the waste within the hospital takes lot of time as the place is large and laso there is no shorter way of transport

storage

- After collection of the waste, the waste is stored in central store area and the waste collector truck comes veryday at 9 am in the morning and take the waste from the store area after checking the records.

CHECKLIST

CHECKLIST
Needle cutter
BMW Collection
Hypochlorite solution
PPE kit usage
BMW Segregation
Records
General waste segregation
Color coded trolleys
Symbol on bags
Labeling
Mercury spill management
Time
Details on bag

OBSERVATIONS

- Needle cutter was present in each and every ward and cleanliness was maintained.
- Biomedical waste and General waste were separately segregated at the point of generation
- In few wards and at the time of waste collection, workers don't use PPE kit while dealing with Biomedical Waste
- Healthcare workers actually report to their senior about the problems they deal with handling of the waste.
- Trainings are done on frequently basis regarding practices of biomedical waste management.
- Hypochlorite solution was made every day in the wards, actually all the staff was confused regarding the use of white puncture proof for needles
- There were hoardings for biomedical waste, mercury spill management, needle stick injury and cleaning process in all the wards.

OBSERVATIONS

- Cleanliness was observed in all the wards , daily mopping and grooming were done
- Bar-coding of the waste bags will be available from the next month
- Labeling and details were not taken at the time of transport of waste.
- Many wards fail in maintaining records of biomedical waste
- Special attention is given for dealing with the waste in Labor room, O.T, Trauma and blood bank.
- Color coded trolleys were not used for collection of waste.
- At times, waste was not collected from the wards on daily basis.
- Non chlorinated plastic bags were unavailable for few days due to stock issues.
- The waste was collected on a particular time from each ward
- Biohazard symbol was present in all the containers
- There is no weighing machine in the hospital to weigh the weight of the waste
- There is no facility for liquid waste water treatment.

CONCLUSION

- The status of knowledge among the respondents in some aspects was found to be as follows: Majority of the respondents aware about the legislation, segregation and generation of biomedical waste and regarding knowledge about color coded bags .Maximum of them could recognize the Biohazard symbol and also knew the importance of Hypochlorite solution. While nearly 1/4th of them knew about infectious waste generation in the hospital and less than 1/4th were aware about the incinerator facility in the hospital. Less than half of the respondents were aware about the treatment of liquid waste water treatment and also they did not know about maximum time limit for untreated waste.

CONCLUSION

- The status of practice among the respondents in some aspects was found to be as follows: Maximum of them correctly followed the practice of color coded bins, attended training programmes, use PPE kit while handling waste and also they inform the committee regarding injuries and untreated waste. Less number of respondents attended training programmes in past one year and also few respondents maintain the records of biomedical waste management.

CONCLUSION

- Process of biomedical waste management lacks monitoring as the transport of waste does not function properly and waste collection also has to be monitored as only green colored trolleys are used. With the help of personal observations, it was found that the most of the wards, they do not maintain the records properly .Those who collect waste, don't use PPE most of the time. Only green colored trolleys are used for collection of waste. During the personal observations, it was found that they have a lenient attitude towards biomedical waste management as most of the staff does think that there is more important work in the administration other than Biomedical Waste Management. There are practices which are yet to be followed by the hospital staff and management according to 2016 guidelines

CONCLUSION

- Attitude was assessed looking over some parameters as follows:
- Maximum respondents disagree with the statement that safe management efforts of Biomedical waste management is not an issue at all and few of them have no idea about the statement as their answer was neutral on this
- Thus there is a need to improve their attitude towards importance of safe management efforts of Biomedical waste Management. Nearly half of them also think that safe management efforts of biomedical waste management increase the financial burden on management . This helps us to find out that they don't know the relation between economy and safe practices. Maximum of them have a positive attitude towards importance of training regarding Biomedical waste management practices , vaccination against tetanus and Hepatitis B, waste management is a team work and significance of PPE

RECOMMENDATIONS

- Monthly training programs and workshops is must to increase their knowledge and improve their attitude towards some biomedical waste management practices.
- Use of PPE Kit must be emphasized in training programmes and workshops.
- Monitoring and supervision should be strengthened regarding the use of PPE is required.
- .Monthly audits and meetings should be done
- I would suggest starting the liquid treatment plant in the hospital premises for the treatment .Not only the staff but also the patients must understand the need of safe management of biomedical waste, which could effectively improve the attitude positively towards this issue. We should start raising this issue publicly with the help of radio, newspaper articles, blogs and IEC material. I think we need to make people aware about the importance of Biomedical Waste similar to other social issues because ultimately this can impact the health status of the society.
- Hospital should start with the small awareness campaigns in the premises and should start with the radio stations in the hospital for daily news and events.

RECOMMENDATIONS

- There should be days where all the staff can communicate together, so hospital administration can do small functions. These functions can build the communication gap among the staff and also these can act as a platform for raising awareness and improving attitude towards safe biomedical waste management.

THANK YOU