

Original article:

Awareness of Bio-medical waste management among the health care workers in rural area

¹Ms. DardiCharanKaur,² DrAasthaPandey, ³DrDeepaTekwani,⁴ MrsMadhura Y Bedekar,⁵ Dr Maya Pai, ⁶DrMeenaAgarwal

¹Assistant Professor, Department of Microbiology,

²Associate Professor, Department of Community Medicine,

³ Associate Professor , Department of Pathology,

⁴Assistant Professor, Department of Physiology,

⁵Consultant , Department of Medicine,

⁶Professor, Department of Physiology,

Name of the Institute/College: Maharashtra Institute of Medical Education & Research (MIMER), Talegaon Dabhade, Pune , India

Corresponding author: Dardi CharanKaur

Abstract

Lack of awareness and inadequate knowledge on Bio-medical Waste Management has led to the hospitals becoming hub for spreading illness. So the present study was undertaken with the aims to know the Awareness and practice of Bio-medical Waste Management among the health care workers.

Materials& Methods: The Prospective, cross-sectional survey was carried out in the 125 health care workers. A pretested, self-administered questionnaire on awareness of Bio-medical waste management policy and practice were given to the health care workers. Informed consent was obtained from the health care workers (HCW's).

Results: Among 125 HCW, 83(66.40%) knew about the Authorization to be obtained from Pollution Control board, but only 20 (16%) knew when it is required. 89% technicians, 83% Doctors, 70% nursing staff, 16% Class IV knew about Bio-medical waste management policy. Overall 45% HCW have undergone the training programs. However 7/41 (17.1%) of Doctors and 2/25(8%) of Class IV staff were reluctant to undergo training programs.

Knowledge of color code and waste segregation was better in technical staff as compared to sanitary staff. Nursing staff 20 (86.96%) had highest scores as far as knowledge about Segregation and colour code of BMW followed by Technicians 14(77.78%), Doctors 27(65.85%), Interns 10(55.56%) and Class IV 9(36%).

Awareness of Bio-medical waste increased as years of experience and educational qualification increased. Gender-wise no difference was noted as far as knowledge regarding Bio-medical waste was concerned.

Conclusion: Importance of Bio-medical Waste Management awareness needs to be emphasized to the HCW. Intensive training and orientation programs for the staff at regular intervals should be conducted for the new-comers to understand the hospital function and Bio-medical waste management and handlings.

Keywords: Bio-medical Waste Management, practice, experience and educational qualification

Introduction:

Over the years there have been tremendous advancements in Health care system. However it is ironic that health care settings which restore and maintain community health are also threatening their well-being. Poor waste management practices pose a huge risk to the health of the Public, Patients & Professionals and contribute to environmental degradation.⁽¹⁾ Nearly 3.2 million tons of medical waste is generated by hospitals alone each year. EPA estimates that 10 to 15 percent of all medical waste is potentially infectious.⁽²⁾

The Bio-medical waste management issue was discussed for the first time at a meeting convened by the WHO Regional office for Europe at Bergen, Norway in 1983. The seriousness of the issue was brought to the limelight during "Beach wash-ups" of summer 1988.⁽³⁾ Investigation carried out by the Environmental Protection Agency of USA in this regard culminated in the passing of Medical Waste Tracking Act (Mwta) November 1988. This made USA the pioneer as far as waste management is concerned'.

With the passage of time the problem has evolved as a global humanitarian issue. In our country, this issue has attracted the attention of the Honorable Supreme Court of India and Guidelines has been issued.⁽⁴⁾ The rules framed by the Ministry of Environment and Forests (MoEF), Govt. of India, known as '**Bio-medical Waste (Management and Handling) Rules, 1998,**' notified on 20th July 1998, with subsequent amendment (June 2000, September 2003, 2011) under the provision of Environment Protection Act 1986. The Bio-medical Waste (Management & Handling) Rules 1998 lay down clear methods for disposal of Bio-medical Waste. Pollution Control Boards of every state have been

given the task of authorizing and implementing the rules.⁽⁵⁾

Accordingly all the hospitals in the public and private sector are now bound to follow these rules to evade legal action⁽⁵⁾

Bio-medical Waste is defined as any waste generated during the diagnosis, treatment or immunization of human being or animals or in the research activities used in the production or testing of biological.⁽⁵⁾

According to WHO, Hepatitis Virus can survive in dry condition for a week or more. Worldwide more than 8 million Hepatitis B, more than 2.3 million Hepatitis C and more than 8000 cases of HIV infections are estimated to occur yearly from the reuse of syringe and needles without sterilization.⁽⁶⁾

Thus there is need for proper health care waste management to ensure the safety of health care workers and the community at large.

India generates around 3 million tons of medical waste every year and the amount is expected to grow at 8% annually.⁽⁷⁾ Lack of awareness and inadequate knowledge has led to the hospitals becoming hub for spreading illness.⁽⁸⁾ Thus, Bio-medical waste (BMW) collection and proper disposal has become a significant concern for both the medical and the general community. Since the implementation of the Bio-medical Waste Management and Handling Rules (1998), every concerned health personnel is expected to have proper knowledge, practice, and capacity to guide others for waste collection and management, and proper handling techniques. So the present study was undertaken with the aims

1. To assess the awareness regarding the Bio-medical waste management policy

2. To assess the awareness regarding the waste management practice and knowledge
3. Qualification wise awareness of practice regarding Bio-Medical Waste among Healthcare workers
4. Experience wise awareness of knowledge of BMW among healthcare workers

Materials& Methods:

The Prospective study was carried out in the tertiary care rural hospital during the period of November 2014 to January 2015. The cross-sectional survey was carried out in the 125 employees including teaching and non-teaching staff.

A pretested, self-administered questionnaire on awareness of Bio-medical waste management policy and practice were given to the health care workers. Before administering the questionnaire the purpose of the study was explained to all participating employees. Anonymity of the participants was maintained. Informed consent was obtained from the health care workers. Statistical analysis was done by using (Microsoft Excel) standard normal test (z test). A p value of <0.05 was taken as statistically significant.

Results:

Among 125 HCW, 83(66.40%) knew about the Authorization to be obtained from PCB, but only 20 (16%) knew when it is required.

Table 1: Awareness of BMW management policy among Health care workers

Category	Total	Authorization to be obtained from PCB	When it is required.
Doctor	41	34(82.93%)	15(36.59%)
Interns	18	13(72.22%)	1(5.56%)
Nursing staff	23	16(69.56%)	2(10.53%)
Technicians	18	16(88.89%)	2(11.11%)
Class IV	25	4(16%)	0
	125	83(66.40%)	20(16%)

The above table shows that 66.4% of health care workers were aware that authorization is needed from Pollution Control board for the Bio-medical waste disposal

Table 2: Willingness of the participant to undergo training programme

Category	Total	Participant not undergone training programme. No (%)	Participant unwilling to undergo training programme. No (%)
Doctor	41	29 (70.73)	7 (24.14)
Interns	18	12 (66.67)	1 (8.33)
Nursing staff	23	8 (34.78)	0
Technicians	18	7 (38.89)	0
Class IV	25	13 (52)	2 (15.38)
	125	69 (55.2%)	10 (14.5%)

The above table depicts 55.2% of the participant not undergone training programme and 14.5% were unwilling to undergo training programme

Table 3: Awareness of segregation and colour coding of Bio-medical waste among health care workers

Category	Score		
	5-3	2-1	0
Doctor(41)	27(65.85%)	3(7.32%)	11(26.83%)
Interns(18)	10(55.56%)	4(22.22%)	4(22.22%)
Nursing staff(23)	20(86.96%)	2(8.70%)	1(4.35%)
Technicians(18)	14(77.78%)	2(11.11%)	2(11.11%)
Class IV(25)	9(36%)	8(32%)	8(32%)
Total(125)	80(64%)	19(15.20%)	26 (20.8%)

The above table depicts that amongst all classes, Nursing staff 20 (86.96%) had highest scores as far as knowledge about Segregation and colour code of BMW followed by Technicians 14 (77.78%), Doctors 27 (65.85%), Interns 10(55.56%) and Class IV 9(36%)

Table 4: Experience wise awareness of knowledge of BMW among healthcare workers

Years of experience	Category					Total
	Doctor (41) %	Interns (18) %	Nursing (23) %	Technicians (18) %	Class IV (25) %	
1 day -5yrs	17/19(89.47)	9(50)	4/7(57.14%)	3/4(75%)	4/8(50%)	37/56(66.07%)
6-10 yrs	8/8(100%)		6/7(85.71%)	6/7(85.71%)	2/4(50%)	22/26(84.62%)
11-15 yrs	7/7(100%)		4/5(80%)	2/3(66.67%)	5/7(71.43%)	18/22(81.82%)
16-20yrs	2/3(66.67%)		1/2(50%)	2/3(66.67%)	2/3(66.67%)	7/11(63.64%)
21 yrs and above	3/4(75%)		1/2 50%)	1/1(100%)	1/3(33.33%)	6/10(60%)
	37(90.24)	9(50)	16(88.89%)	14(77.78%)	14(56%)	90(72%)

Table 5: Qualification-wise awareness of practice regarding Bio-Medical Waste among Healthcare workers

Category	Total No	Policy No (%)	Segregation / Color Code	Knowledge No (%)	Practice No (%)
Post- Graduate	41	36 (87.80%)	32 (78.04%)	34 (82.93%)	30 (73.17%)
Graduate	59	43 (72.88%)	39(66.10%)	42 (71.18%)	39 (66.10%)
Secondary	8	2 (25%)	4 (40%)	5 (62.5%)	4 (50%)
Primary	7	1 (14.29%)	3 (42.86%)	4 (57.14%)	3 (42.86%)
Illiterate No Education	10	1 (10%)	2 (20%)	5 (50%)	4 (40%)

The above depicts that awareness of practice and knowledge of Bio-medical waste increased with increase in educational qualification.

Table 6: Gender -wise awareness of practice regarding Bio-Medical Waste among Healthcare workers

Total	Category	Policy	Segregation / Color Code	Knowledge	Practice
Male n=47	Doctor (23)	18 (78.26%)	12 (52.17%)	19 (82.61%)	20(86.96%)
	Interns (5)	3 (60%)	3 (60%)	3 (60%)	3 (60%)
	Nursing Staff(6)	3(50%)	4 (66.67%)	4 (66.67%)	5 (83.33%)
	Technicians (3)	3 (100%)	2 (66.67%)	2(66.67%)	1(33.33%)
	Class IV (10)	2 (20%)	5 (50%)	6 (60%)	4 (40%)
	47	29 (61.70%)	26 (55.32%)	34 (72.34%)	33 (70.21%)
Total	Category	Policy	Segregation / Color Code	Knowledge	Practice
Female N=78	Doctor (18)	16 (88.89%)	15 (83.33%)	16 (88.89%)	14(77.78%)
	Interns (13)	10 (76.92%)	7 (53.85%)	6 (46.15%)	7 (53.85%)
	Nursing Staff (17)	13 (76.47%)	16 (94.11%)	12(70.59%)	15(88.24%)
	Technicians(15)	13(86.67%)	12 (80%)	14(93.33%)	13(86.67%)
	Class IV (15)	2(13.33%)	4 (26.67%)	8 (53.33%)	7 (70%)
	78	54 (69.23%)	54 (69.23%)	56(71.79%)	59 (75.64%)

This table shows that as far as knowledge regarding Bio-medical waste was concerned there was no difference between males and females

Discussion:

Health care waste refers to all the waste generated by a health care establishment. It is estimated that 10-25% of health care waste is hazardous, with the potential for creating a variety of health problems⁽³⁾ The overall awareness of Bio-medical waste management policy among 125 Health care workers in our study was 83(66.40%). Chudasama et al reported 51.4%.⁽⁹⁾ In our study we observed 89% technicians, 83% Doctors, and 70% nursing staff knew about Bio-medical waste management policy. Our findings are similar to the study of Malini et al who reported technicians had 100%, followed by Doctors (95.2%), nursing staff (92.9%) and the study of S. Saini et al in their study in which Doctors had 85% knowledge; nurses-60% and Sanitary staff 14%.^(8,10)

In our study Class IV had poor knowledge regarding Bio-medical waste management policy (16%), similar was the study of Malini et al who had 8.2%.

⁽⁸⁾ This shows that people with higher education have more awareness about Bio-medical waste management policy. One interesting finding in our study was that Interns had only 50 % awareness about Bio-medical waste management policy which was less than that of the nursing staff.

We have a regular training programme for Bio-medical waste management and practice in the hospital premises and 32% doctors and 33% interns had undergone the training programme. These figures were less than that in the study done by Malini A et al in which 50% doctors and nurses had undergone some form of training. However this was more than the findings by S. Saini et al in which 20% doctors had got trained.^(8,10)

Most of the staff showed a positive attitude towards the training programme and were willing to undergo further training. However 24.14 % of Doctors and 15.38% of Class IV staff were reluctant to undergo training programme.

Segregation of waste and colour coding was also studied among HCW's, Knowledge of color code and waste segregation was better in technical staff as compared to sanitary staff. We observed 87% nursing staff had more than 70% knowledge, followed by technicians -78%, Doctors-67%, interns-55%, and Class IV-36%. Similar results were seen in the study by V. Mathur et al. ⁽¹¹⁾

In our study awareness of Bio-medical waste increased as years of experience increased. Doctors who had worked for more than 5 years in the Institute, almost 100% gave correct answers about Bio-medical waste management. But it was not so in Nursing and Technical staff. Nursing staff who had worked for 20 years or more showed only 50% awareness and Class IV showed 33%. However technicians working for more than 20 years or more showed 100 % awareness. This is in contrast to the study of Rekha et al in which 30% Doctor, 20% Nursing staff had Knowledge regarding proper collection and safe disposal. ⁽¹²⁾

Statistical significance was observed according to the Qualification of the healthcare workers. We noted that Post-graduates had almost 88% awareness of policy, 78 % awareness about segregation and colour

coding. 56% had knowledge and 68% were practicing the adequate Bio-medical waste management techniques. This proves that knowledge and practice increases with increase in educational level. Similar results were seen in the study by Sengodan et al in which knowledge is commensurate with educational level of different staff working in the hospital. ⁽¹³⁾

Gender wise, no Statistical significance was observed. We noted 69% females had awareness about policy as compared to males 61%. Also females had more awareness about colour coding 69% as compared to males 55%. However males had more knowledge (78%) about BMW Management as compared to females (74%) and also practice 79% as compared to females 75%.

Conclusion:

Intensive training and orientation programme for the staff at regular interval, with special importance to the new-comers to understand the hospital function and Bio-medical waste management and handlings. We recommend strict supervision and surveillance should be followed in day to day hospital waste management activity.

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