

## Original Research

### Knowledge, Attitude and Practice of Biomedical Waste Management Practices in Institution- A cross-sectional study

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#### ABSTRACT:

**Background-** As a considerate topic the biomedical waste and their proper management has become a worldwide issue. Across all specialties, doctors need to have exemplary professional practice in managing biomedical wastes. **Materials and Methods-** A descriptive cross-sectional study was conducted among 250 participants. The ethical clearance was obtained through the Institutional review board. A pre validated questionnaire was used for data collection and descriptive statistics were done using statistical package for social sciences (SPSS) 21.0v (SPSS Inc., Chicago, IL, USA). **Results-** Table shows the Knowledge, Attitude and Practice of health personnel regarding BMW management in which 100% dental students, 97.5% nursing students, 91.6% lab technicians and 65.7% Class IV employees knew the primary source of BMW. Most of the specialists in our review thought that protected removal of BMW is important. Most of the healthcare personnel had done with hepatitis b vaccination these results are similar with the other studies. **Conclusion-** The results of our study and other related studies makes it obvious that still the knowledge and practices of healthcare workers nevertheless there is a need for improvement to reduce the hazards of biomedical waste and cost of its management.

**Keywords-** Knowledge, Attitude, Practice, Biomedical Waste Management

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#### INTRODUCTION

Non biodegradable waste from gloves, gauze, plastic syringes, silicone, plasters, X-ray revealing liquid, amid other products, is regularly produced during clinical activities in health centres are the causes of environmental pollution. This waste is commonly referred to as biomedical waste (BMW), while it is also known as clinical waste, medical waste and sanitary waste in many parts of the world. <sup>[1]</sup>The WHO approximates that 85% of hospital waste is non-hazardous; around 10% is infectious, while the remaining 5% is non-infectious. All institution has guidelines and protocol for management of biomedical waste. These rules and protocols should strictly be followed at each level of generation, collection, transportation, storage, treatment, and disposal. At the level of generation itself, biomedical waste should be separated into color-coded bags or containers. <sup>[2]</sup>For every successful health care group to function, including dentistry, it is important to have

awareness about the disposal of hazardous medical waste, which here relates to dental waste. <sup>[3]</sup>Awareness about the proper management of medical and dental waste products, particularly infectious ones, is of greatest importance for the appropriate care of patients, people, and the environment. <sup>[4]</sup>

The BMW produced in the dental clinics can be divided into sharp instruments, used disposable items, infectious waste (blood-soaked cotton, gauze, etc.) hazardous waste such as mercury and lead, and chemical waste such as film developer, fixers, and disinfectant. The main BMW in our field is handling of mercury and disposal of lead. Dentist and dental personnel have been directly and indirectly exposed to mercury (Hg) emission from incinerator and Hg from wastewater from various sources. <sup>[5]</sup>As a caring topic the biomedical waste and their proper management has become a worldwide issue. International hazards of biomedical wastes and their

bad management have raised up a worry especially on the ground of its far-reaching effects on human as well as health and environment (Govt. of India, 1998). Throughout the care of patients some hospital wastes are produced that have numerous harmful as well as adverse effects to the environment.<sup>[6]</sup>As seen in many studies, this carelessness is attributed to insufficient awareness of the current regulations and also absence of understanding and implementation to practice the same in day-to-day dentistry.<sup>[7]</sup>Across all specialties, doctors need to have exemplary professional practice in managing biomedical wastes.<sup>[8]</sup>Moreover, the persons in contact with the waste directly or indirectly are at risk of attaining these hazards. Hence, protective protocols and the practice of personal protective instruments must be established and ensured.

**MATERIALS AND METHODS**

A descriptive cross- sectional study was conducted among 250 participants. The selection of the

participants was done through random sampling. The study group comprised of healthcare personnel who included dental students, nursing students, laboratory technicians and Class IV employees working in our institution after taking their written consent. The ethical clearance was obtained through the Institutional review board (DJD/3645/0000/2017). All the healthcare personnel that are present at the day of survey are included in the study. Those who didn't give written consent are not included in the study.

**QUESTIONNAIRE**

A pre validated questionnaire was used for data collection as this questionnaire was used in the study done by Anand et al in 2016. The collected data were analyzed and descriptive statistics were done using statistical package for social sciences (SPSS) 21.0v (SPSS Inc., Chicago, IL, USA).

**RESULTS**

**Table 1: Knowledge of health personnel regarding BMW management**

Knowledge on BMW management	Dental Students (N=120)	Nursing Students (N=80)	Lab technicians (N=12)	Class IV employees (N=38)
Primary source of BMW	120 (100%)	78(97.5%)	11(91.6%)	25(65.7%)
Knowledge of different BMW categories	116(96.6%)	62(77.5%)	9(75%)	20(52.6%)
BMW management rules	94(78.3%)	60(75%)	8(66.6%)	18(47.3)
BMW Storage	105(87.5%)	55(68.7%)	7(58.3%)	22(57.8%)
Biohazard symbol	110(91.6%)	72(90%)	10(83.3%)	27(71%)
Colour coding of containers	115(95.8%)	74(92.5%)	9(75%)	21(55.2%)
BMW disposal	106(88.3%)	70(87.5%)	10(83.3)	24(63.1%)
Universal precautions	120(100%)	78(97.5%)	11(91.6%)	15(39.4%)
Diseases transmitted by BMW	112(93.3)	67(83.75)	10(83.3%)	26(68.4%)

There are 250 participants in which 120 dental students, 80 nursing students, 12 lab technicians and 38 Class IV employees participated in the study. Table 1 shows the Knowledge of health personnel regarding BMW management in which 100% dental students, 97.5% nursing students, 91.6% lab technicians and 65.7% Class IV employees knew the primary source of BMW. Around 96.6% dental students had Knowledge of different BMW categories whereas nursing students had 77.5%, lab technician 75% and Class IV employees 52.6%.78.3% of dental students had knowledge about BMW rules followed by 75% nursing students.66.6% lab technician and 47.3% Class IV employees.87% of dental students, 68.7% nursing students, 58.3% labtechnicianand 57.8% Class IV employees had knowledge about BMW storage. They had

knowledge that BMW cannot be stored beyond 48 hours. 91.6% dental students, 90% nursing students, 83.3% lab technician and 71% Class IV employees could correctly identify the biohazard symbol.95.8% dental students, 92.5% nursing students, 75% lab technician and 55.2%Class IV employees had knowledge about the colour coding of containers whereas in case of BMW disposal 88.3% dental students, 87.5% nursing students, 83.3% lab technician and 63.1% Class IV employees gave positive response.Around 100% dental students, 97.5% nursing students, 91.6% lab technician and 39.4% Class IV employees had proper knowledge about universal precautions. Knowledge regarding disease transmission 93% dental students, 83.3% nursing students, 83.3% lab technician and 68.4% lab technician gave positive responses.

**Table 2: Attitude of health personnel regarding BMW management**

Attitude on BMW management	Dental Students (N=120)	Nursing Students (N=80)	Lab technicians (N=12)	Class IV employees (N=38)
Safe disposal of BMW is necessary	120(100%)	79(98.75%)	10(83.3%)	25(65.7%)

BMW management is a team work	120(100%)	74(92.5%)	8(66.6%)	22(57.8%)
BMW management creates extra burden on my work	67(55.8%)	64(80%)	5(41.6%)	25(65.7%)
BMW management is a financial burden on hospitals	70(58.3%)	69(86.2%)	9(75%)	29(76.3%)
Upgrade knowledge on BMW management	120(100%)	72(90%)	11(91.6%)	23(60.5%)

Table 2 shows the Attitude of health personnel regarding BMW management. Most of the specialists in our review thought that protected removal of BMW is important and it is a groupfill in when contrasted with 65.7% of class IV representatives as it is low in all. 80% of nursing and 55.8% of dental students felt

that BMW made additional weight on their work while 65.7 % of class IV representatives had similar opinions. 86.2% of nursing students felt that BMW management is a financial burden on hospitals. Most of the specialists needed to Upgrade knowledge on BMW management.

**Table 3: Practice of health personnel regarding BMW management**

Practice of BMW management	Dental Students (N=120)	Nursing Students (N=80)	Lab technicians (N=12)	Class IV employees (N=38)
Don't recap used needles	120(100%)	80(100%)	12(100%)	35(92.1%)
Discard used needles in needle destroyer	117(97.5%)	63(78.7%)	9(75%)	29(76.3%)
Disposal of BMW waste in specified colour coded containers	108(90%)	74(92.5%)	4(33.3%)	23(60.5%)
Hepatitis b vaccination done	102(85%)	45(37.5%)	6(50%)	17(44.7%)
Injury reporting due to sharps	24(20%)	24(30%)	2(16.6%)	10(26.3%)

Table 3 shows the Practice of health personnel regarding BMW management. All specialists in our study said they don't recap used needles whereas most of the specialist discard used needles in needle destroyer. 90% of dental students, 92.5% of nursing students, 33.3% lab technician and 60.5% Class IV employees had practiced Disposal of BMW waste in specified colour coded containers. Most of the healthcare personnel had done with hepatitis b vaccination. 26.3% of class IV employees reported injury due to sharps as compared to 20% of dental students, 30% of nurses and 16.6% of lab technicians.

## DISCUSSION

The study was conducted to assess the knowledge, attitude and practice of biomedical waste management of health personnel in the institution. Knowledge regarding BMW management among doctors, nurses and lab technicians was found to be good as compared to class IV employees in our study. This finding was similar as the study done by Anand et al in 2016.<sup>[10]</sup> This low result can be due to improper training of the employees.

In the present study dental students were found to have adequate knowledge (78.3%) about the biomedical waste management rules this finding is similar as the study done by Anand et al.<sup>[10]</sup> In parameter like knowledge regarding segregation of waste at source 96.6%, Colour coding for waste containers 95.8%, disinfection of hospital waste before disposal 88.3% and transmission of disease through biomedical waste 93.3% results shows similarity with the study done by Anand et al. Majority of doctors (87.5%) in our study correctly identified Biohazard symbol whereas in case of

Class IV employees only 39.4% identified. This was consistent with the studies previously done by Basu et al and Anand et al.<sup>[10,11]</sup> Anand et al reported 100 % identification of biohazard symbol whereas in my study only 83.3% responded positively. About 90% of the nursing students identified the biohazard symbol which is higher as compared to the study done by Anand et al in which only 52 % responded positively.<sup>[10]</sup> The present study population excluding class IV employees was aware about various methods. Awareness about diseases transmitted by BMW was good among majority of doctors, nurses and lab technicians in our study. This finding was well-suited with previous studies done by Anand et al. Attitude of doctors, nurses and lab technicians towards BMW management was found to be positive in our study as compared to class IV employees. It was reliable with the findings of Tenglikar et al and Anand et al where they found that attitude of an individual towards any health behaviour was directly proportional to knowledge level of that individual.<sup>[10,12]</sup> Most of the nursing students realised that BMW management is a team work and it did not create extra burden on their work as seen in study by Anand et al.<sup>[10]</sup>

The practices regarding BMW management were followed by most of the doctors, lab technicians and nursing staff in our study while class IV employees were not satisfactory on various parameters, this result was similar with the previous study. Only 26.3% of class IV employees were vaccinated against Hepatitis B and Injury reporting due to sharps was also low among all groups which was similar as reported by Ananda et al previously. Anand et al reported that only 29.2% of study population ever

reported needle stick injury. <sup>[10]</sup>In this study it was found that most of the health care facilities did not fulfil the parameters which meant lack of a sincere BMW management system in place and improvement is required. The study cannot be generalised due to its small sample size.

### CONCLUSION

The results of our study and other related studies makes it obvious that still the knowledge and practices of healthcare workers nevertheless there is a need for improvement to reduce the hazards of biomedical waste and cost of its management. BMW management through visits to treatment facilities and also ensure that students, technicians and workers follow rules on appropriate waste management strictly itself.

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