



## Knowledge about biomedical waste management among medical students of a tertiary care hospital, tirupati

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### Abstract:

**Back Ground:** Today about one fourth of biomedical waste is considered as hazardous and may affect the health of both medical personnel and general community. As medical students are going to be one of the important components of health care system, they should have proper and sufficient knowledge on biomedical waste management. So awareness about various aspects of biomedical waste management has to be assessed frequently. **Objective:** To know the existing awareness and knowledge about biomedical waste management among medical students of a tertiary care hospital, Tirupati. **Material and Methods:** Cross-sectional study was done in 127 students of 7th semester from Sri Venkateswara Medical college, Tirupati, by pre-designed questionnaire. The responses were analyzed using epi info software 3.5.1 version. **Results:** Majority (74.8%) of the students are between 21-22 years. 114(89.8%) students are not aware of BMW legislation. It was found that knowledge regarding handling and safe disposal biomedical waste management among 54(42.5%) medical students was inadequate. Majority has deficient in knowledge and awareness regarding categories of bio medical waste (73.2%) and its disposal in colour bags (71.3%). **Conclusions:** Frequent awareness campaigns and classes may be conducted to improve the knowledge about safe handling and disposal of bio medical waste among medical students for future practical application.

**Key words-** Awareness, Bio medical waste, health care waste, Medical students

### Introduction

Today about 10-25% of biomedical waste (BMW) is considered as hazardous and may create a variety of health risk [1]. It may affect the health of both medical personnel and general community [2]. From the time of implementation of the Biomedical Waste Management and Handling Rules (1998) [3], 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. Inadequate and inappropriate handling of health care waste (HCW) may have serious public health consequences and a significant impact on the environment. The medical professionals have tubular vision on patient care services and pay very little heeds to support services in the overall context of comprehensive patient welfare. In the field of medical practice statutory public health guidelines for Biomedical waste Management and close monitoring of its compliance alone cannot achieve the ultimate goal, if it is not accompanied with social science approach of mass education motivation and change of mind set in all strata of medical practice [4]. As medical students are going to be one of the important components of health

care system, they should have proper and sufficient knowledge on biomedical waste management. So awareness about various aspects of biomedical waste management has to be assessed frequently.

### Aim

To know the existing awareness and knowledge about biomedical waste management among medical students of a tertiary care hospital, Tirupati.

### Materials & methods

A cross-sectional study was designed and conducted during the period of november 2012. Participants are 127 students of VII<sup>th</sup> semester from Sri Venkateswara Medical College, Tirupati. A pretested, predesigned questionnaire was given to the participants during their regular class hours after explaining the purpose of the study. Questionnaire contains questions regarding general information, handling, disposal and health hazards of biomedical waste. Questionnaires were collected anonymously after completion from the participants. Responses to the questionnaire are coded and entered into Excel Sheet. Later data was analyzed

using epiinfo software 3.5.1 version. Institutional ethical approval is taken for the study.

## Results and discussion:

Majority (74.8%) of the students participated in the study were in the age group of 21-22. Most of the students were males (55.12%).

**Table 1: Awareness regarding general information about BMW**

	Correct	Percentage
BMW definition	6	4.7%
BMW legislation year(1998)	2	1.6%
Bio hazard symbol	98	78%
Percentage of hazardous HCW(10-25%)	43	33.9%
Max. proportion of HCW(General waste)	25	19.7%
Segregation done at(source)	52	40.9%
No. of BMW category(10)	34	26.8%

Table-1 depicts that 85(66.9%) and 13(10.2%) were aware of bio medical waste and BMW legislation respectively. Only 2(1.6%) responded correctly about the year in which BMW legislation was implemented i.e., 1998. Whereas a study among dental students in Maharashtra [5], revealed that 31% students answered the year 1998.

**Table 2: Awareness about BMW & Colour of disposal bag used**

Type of BMW	Correct	Percentage
Human anatomical waste (Yellow)	29	22.8%
Ampoule (Blue)	33	26%
Syringe (Blue)	34	26.8%
IV sets, rubber tubings (Blue)	37	29.1%
Needles (Blue/White)	28	22%
Dressings (Red/Yellow)	40	31.5%
Micro & Biotechnology waste (Red/Yellow)	57	44.9%
Expired & Discard medicines (Black)	26	20.8%
Chemical waste (Black)	47	37%
Ash (Black)	38	29.9%
Paper (Black)	26	20.5%

Only 34(26.8%) participants know that the number of BMW categories are 10, and it was 80% in Maharashtra study [5]. Out of 127 students, 52(40.9%) students responded that segregation is done at Source and 43 (33.9%) are aware that the percentage of hazardous Health care waste is 10-25%. Table-2 shows the details about the awareness pertaining to BMW & colour of the disposal bag used. On an average 28.3% of the medical students have sufficient knowledge about BMW & colour of the disposal bag used. It is nearly 80% in other study [5] among dental students. A study by Janvi et al [6] revealed nil response in this aspect.

**Table 3: Awareness about diseases spread by BMW**

Diseases	Yes	Percentage
HIV	118	92.9%
Hep-B	121	95.3%
Hep-C	79	62.2%
TB	36	28.3%
Tetanus	71	55.9%
Syphilis	56	44.1%
Leprosy	59	46.5%
DM	23	18.1%
RHD	94	74%

Table-3 discloses the awareness regarding infectious diseases transmitted by improper handling of BMW. 92.9% and 95.3% of students responded for HIV and Hep-B respectively as the infectious diseases which can be transmitted by improper handling of BMW. In a similar study among medical students at Vizianagaram [7], it was found that 78.87% and 58.91% of students responded for HIV and Hep-B respectively. 23 (18.1%) & 94 (74%) students has misconception that diabetes mellitus and rheumatic heart disease respectively can be transmitted by improper handling of BMW. 82 (64.5%) & 67 (52.7%) do not know about the commonly used chemical disinfectants like hypo & bleaching powder respectively. 54 (42.5%) participants are not aware of BMW disposal/treatment methods like Incineration, Chemical disinfection. Further most of the students are not vaccinated against Hep-B (60.6%) and TT every 5years (40.9%)

## Conclusions

A total of 127 VII<sup>th</sup> semester participated in the study. Out of which 114(89.8%) students are not aware of BMW legislation. 54(42.5%) medical students had deficit in knowledge regarding handling and safe disposal biomedical waste management. On an average

71.3% participants do not have proper knowledge about the colour coding of the bags used during handling of BMW. Majority of the students are not aware regarding categories of bio medical waste (73.2%) and its disposal in colour bags (71.3%).

**Table 4: Awareness about chemical disinfectants used to treat BMW**

Chemical disinfectants	Yes	Percentage
Hypo	45	35.4%
Bleaching powder	60	47.2%
Phenol	89	70%
Cresol	20	15.7%

### Recommendations

Frequent awareness campaigns and classes may be conducted to improve the knowledge about safe handling and disposal of bio medical waste among medical students for future practical application. Level of Awareness & Knowledge regarding BMW management has to be assessed regularly and periodically among the medical students. Subsequently any deficit pertaining to the knowledge about handling of BMW must be imparted as and when required. Concerned institutional authorities must make compulsory instruction that every medical student should get HBV and TT (every 5 years) vaccination at least at the time of entry into clinical postings.

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**Conflict of Interest:** Nil

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### References

1. Pruss, Circuit E, and Rushbrook p, Safe management of wastes from health-care activities, WHO, 1999.

**Table 5: Vaccination status**

Vaccine	vaccinated	%
Hep-B	Yes -50	39.4%
	No -77	60.6%
TT(every 5 years)	Yes -75	59.1%
	No -52	40.9%

2. Central pollution control board, Environmental standard and guidelines for management of hospital waste. CPCB, Ministry of Environment and Forest, New Delhi, Jun 1996.
3. Government of India. Biomedical Waste (Management and Handling) Rules. 1998. Extraordinary, Part II, Section3, Subsection (ii). The gazette of India, No. 460,27 Jul 1998.
4. S. Saini, S.S. Nagarajan, R.K. Sarma. Knowledge, Attitude and Practices of Bio-Medical Waste Management Amongst Staff of a Tertiary Level Hospital in India. Journal of the Academy of Hospital Administration 2005; vol17(2):1-12
5. Rajiv saini, Matheus Melo Pithon, Hardev K singh, Daniela Veloso Popoff, Knowledge of Biomedical waste management among the dental students of rural dental college, Maharastra, International Journal of Experimental Dental Science 2013; vol2(1):24-6.
6. Janhavi G, Raju PVR. Awareness and training need of biomedical waste management among undergraduate students Andhra Pradesh. Indian J Public Health.2006;50(1):53-4.
7. Ukey Ujwala U, Kambatla Ramasankaram, Dash Satyanarayan, Naidu NR Appajira, Kulkarni Ved P. Awareness about biomedical waste management in undergraduate medical and nursing students at a teaching institute in vizianagaram, andhra pradesh, National Journal of Community Medicine 2012; Volume 3(3):428-

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