

## Awareness of Biomedical waste Management Among Interns: A Cross-Sectional Survey: A Cross-Sectional Study

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### Abstract

**Background:** Health care waste, due to its content of hazardous substances, poses serious threats to environmental health. The issue of biomedical waste comes from the recognition of the seriousness of the problem and the potential danger it posed to the community. In developing countries, medical waste has not received much attention and it is disposed of together with domestic waste. Since the implementation of the Biomedical 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. With objective of level of Knowledge, attitude and practices (KAP) about biomedical waste management among Dental and Medical interns are follow in their set up.

**Materials and methods:** This is cross sectional study comprises of randomly selected Sample from each of the categories of medical and dental interns comprising 145 interns, 72 medical and 73 dental on rolls. A semi-structured questionnaire was used to obtain information from interns. A pretested, self-administered 16 questionnaire containing questions on Knowledge, Attitude and Practice regarding bio-medical waste management was used.

**Results:** The study shows knowledge of Medical and Dental interns about BMW satisfactory except sharp waste should collect in translucent puncture proof container and incineration, the best method for biomedical waste disposal. Only 55.8% of dental intern and 66.7% of medical intern thought that if waste is not treated then there is chance of infection. 56.2% of dental intern and 79.1% of medical intern reported the injury due to improper disposal of sharps item.

**Conclusion:** Knowledge about the BMW management practices in the intern of institution were satisfactory which may be due to subject is included in curricula of Medical and Dental education and periodic CME sessions in the institution for the intern and other different health professional team.

**Keywords:** Bio-medical waste, Knowledge, Practices

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### I. Background

Generation of "Waste" has been an integral part of human activity. Over a period of time the quantity of the waste generated has increased exponentially with the increase in population and changed scenario of human activity and progress. These wastes have been polluting the air, water and soil and imbalance the eco system and adversely affecting the human life and existence. The rapid advances in modern medicine have brought in many newer invasive and noninvasive techniques in diagnostic and management modalities in the treatment of various diseases. This has resulted in many fold increase in generation of the hospital bio medical waste.<sup>1</sup> 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.<sup>2</sup> Health care waste, due to its content of hazardous substances, poses serious threats to environmental health. The hazardous substances include pathological and infectious material, sharps, and chemical wastes.<sup>3-6</sup> In hospitals, different kinds of therapeutic procedures are carried out and result in the production of infectious wastes, sharp objects,

radioactive wastes and chemical materials.<sup>7</sup> Medical waste may carry germs of diseases such as hepatitis B,C and AIDS etc. In developing countries, medical waste has not received much attention and it is disposed of together with domestic waste.<sup>8,9</sup>

Health care waste presents a high risk to doctors, nurses, technicians, sweepers, hospital visitors and patients due to arbitrary management.<sup>10,11</sup> The safe disposal and subsequent destruction of medical waste is a key step in the reduction of illness or injury through contact with this potentially hazardous material, and in the prevention of environmental contamination<sup>12</sup>. The management of medical waste therefore, has been of major concern due to potentially high risks to human health and the environment.<sup>13,14</sup> The issue of biomedical waste comes from there cognition of the seriousness of the problem and the potential danger it posed to the community. Since the implementation of the Biomedical 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.<sup>15</sup> The present study was undertaken with objectives of finding out the level of knowledge and attitude of the dental and medical intern about the biomedical waste and practices (KAP) they are follow in their set up.

## II. Methodology

**Study design:** Cross-sectional type

**Sample size and site:** Random selection of 145 dental and medical interns from different Department of the hospital was included in the study. This study was undertaken at CSM Medical University, a tertiary care centers in Lucknow.

**Time:** This study was carried out in the month of March 2012.

**Study instruments:** A pretested, self-administered 16 questionnaire containing questions on Knowledge, Attitude and Practice regarding bio-medical waste management was used. Before administering the questionnaire the purpose of the study was explained to all participating dental and medical intern.

**Method of Data Collection:** An introductory visit was given to each Department, during which the purpose of the project was explained. The data was collected by the interview and observation.

Statistical analysis was done with SPSS. The data collected by questionnaire survey were coded and analysed with simple descriptive statistics (mainly percentage).

## III. Results

Table-1 shows the knowledge of the respondents regarding Biomedical Medical Waste; Majority of intern respond says that they were aware about biomedical waste rules, different color coded bins for biomedical waste, segregation, transmission of disease about the biomedical waste, needle cutter/burner and public health hazard due to poor biomedical waste management. Approximately half of interns in both categories were aware about the sharp waste should collect in translucent puncture proof container and incineration is the best method for biomedical waste disposal. When we had ask for waste collection in black bin, yellow bin and thought about biomedical waste in safe manner is the responsibility, dental intern gave better response than medical intern.55.8% of dental intern and 66.7% of medical intern thought that if biomedical waste is not properly treated then there is chance of infection. Table-2 shows the practice of the respondents regarding BMW; Majority of intern had practice of keeping biomedical waste in color coded bins and destroying needle with needle cutter/burner after use.57.5% of dental intern and 41.7% of medical intern thought that dumping of untreated biomedical waste in municipal bin is correct.56.2% of dental intern and 79.1% of medical intern reported the injury due to improper disposal of sharps item.

## IV. Discussion And Conclusion

Dental Interns were equally qualified as medical interns so that in the present study will compare dental interns with medical interns. Knowledge about biomedical waste management rule among the interns were satisfactory which was similar in the studies<sup>16-19</sup>. Another study<sup>20</sup> revealed that the dentists need to be educated on Biomedical Waste (Management & Handling) Rules, 1998 through extensive training programme. In few questions dental interns shows more aware than medical like Human Anatomical Waste collection, Segregation of waste at source and Dealing bio-medical waste in safe manner, may be because dental inters enters in the clinic before medical interns. Similarly, knowledge about color coding of bin and biomedical waste segregation (Segregating infectious material from other waste may reduce the volume) which is the most important pivotal point and crucial for further waste management was found better which was similar within the studies.<sup>18</sup>This may be due to institution is using four color coded container as stipulated in the law follow segregation method. Knowledge about incineration, the best method for bio-medical waste disposal was very low in the present survey and in the study<sup>20</sup> showed that majority of them as not aware of proper hospital waste management and in the study<sup>16,18</sup> shows satisfactory result for incineration as the best method for bio-medical waste disposal. In the

present study knowledge of the diseases transmitted through improper BMW management is satisfactory which is similar with study.<sup>16, 18</sup>

Majority of intern aware about the Needle shredder this may be due to availability in every Department of institution and every intern using it. Practice of reporting injuries resulting from improperly disposed biomedical waste was found high. Stein et<sup>21</sup> al in their study reported that among doctors, only 37% reported that they suffered from needle stick injury. The generation of biomedical waste in institute has been increasing in quantity and variety, due to the wide acceptance of single-use disposable items. In the recent past, biomedical waste was often mixed with household waste. In recent times, increased concerns over improper disposal of biomedical waste have led to a movement to regulate the waste more systematically (collection, segregation and disposal of medical waste is performed according to recommended standards). Enforcing strict BMW management law 1998 by the Government, a change in the attitude of the health care personnel in the institution for proper BMW management. The study reveals that knowledge about the BMW management practices in the interns of institution were satisfactory which may be due to subject is included in curricula of Medical and Dental education and periodic CME sessions in the institution for the intern and other different health professional team and motivate them to comply with the rules and guidelines regarding BMW management. Another important thing about the CME sessions in any hospital/institution is that it should be carried at the beginning of new sessions when intern and other staff turnover occurs and new health care personnel join.

**Table: 1** Question about knowledge and attitude about Biomedical waste management (n=145)

Question	Dental intern (n=73)	Medical intern (n=72)	Total (n=145)
Q1.Aware about Bio-Medical Waste Rules, 1998	65 (89%)	65(90%)	130(89.6%)
Q2.Color coded of bins for collection	69 (94.5)	66(91.6)	135(93.1%)
Q3.General waste collection	58(79.4)	48 (66.7)	106(73.1%)
Q4.Human Anatomical Waste collection	53(72.6)	38(52.7)	91(62.7%)
Q5.Sharps Waste collection	39(53.4)	39(54.1)	78(53.8%)
Q6.Segregation of waste at source	68(93.2%)	60(83.3%)	128(88.3%)
Q6.Transmission of diseases through bio-medical waste	71(97.2)	67(93)	138(95.2%)
Q7.Awareness about needle cutter	70(95.9)	69(95.8)	139(95.9%)
Q8.Dealing bio-medical waste in safe manner is the responsibility	66(90.4)	49(68)	115(79.3%)
Q9.If Bio-Medical Waste is not properly treated there is chances of infection	40(54.8)	48(66.7)	88(66.7%)
Q10.Public health hazard due to poor bio-medical waste management	67(91.8)	68(94.4)	135(93.1%)
Q11.Best method for bio-medical waste disposal	33(46.6)	34(47.2)	67(46.2%)
Q12.Dumping of untreated bio-medical waste in municipal bins is correct	42(57.5)	30(41.7)	72(49.6%)

**Table: 2.** Question about Practice of Biomedical waste management

Question	Dental intern (n=73)	Medical intern (n=72)	Total (n=145)
Q13.Do you practice (throw) bio medical waste in the color coded bins	69(94.5)	68(94.4)	137(94.5%)
Q14.Do you destroy needle after use by using needle cutter	72(98.6)	69(95.8)	141(97.2%)
Q15.Did you ever reported the injury due to improper disposal of sharps item	41(56.2)	57(79.1)	98(67.6%)

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