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## Original Research article

# Knowledge, attitude and practices about biomedical waste management among dental undergraduates and post graduates in GDC&H, Hyderabad

**Dr. M Narasimha Lakshmi, Dr. D Ashok Babu and Dr. N Sripriya**

### Abstract

**Background:** Dental waste can be hazardous to humans and the environment. Care is required while disposing clinical waste in order to protect and maintain the immediate environment from contamination and to ensure the safety of those who come in contact with it. It is now time that the curriculum for medical, dental and paramedical education gives due importance to this vital issue.

**Aim of The Study:** The study is aimed to determine the awareness among the students of GDC&H, Hyderabad regarding biomedical waste management policy and practices, their attitude towards biomedical waste management and their awareness regarding needle stick injury.

**Methods:** A cross sectional study is conducted using a questionnaire to assess the knowledge of biomedical waste disposal. It was distributed to the students of GDC&H, Hyderabad.

**Results:** Of the distributed 250 questionnaires, it has showed that there is a poor level of knowledge and awareness of biomedical waste generation hazards, legislation and management among health care personnel.

**Conclusion:** 1) It is concluded from the present study that there are poor levels of knowledge and awareness about biomedical waste generation hazards.

Regular monitoring and training should be required at all levels.

**Keywords:** Biomedical waste, dental clinics, dental graduate, dental waste

### Introduction

The term biomedical waste has been defined as “any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals and includes categories mentioned in Schedule 1 of the biomedical waste (management and handling) rules 1998 [1] “.

Dentists generate only 3% of total medical waste as estimated by US medical waste tracking system [2]. Categories of waste generated in dental practice are

1. Biomedical waste
2. Silver containing waste - seen in X-ray fixer
3. Lead containing waste - seen in X-ray packets & lead apron
4. Mercury containing waste - seen in silver amalgam fillings
5. Chemicals

Staff should be trained in WHMIS for handling of materials.

Proper collection and segregation of biomedical wastes is important [3]. Paper, cardboard, aluminium, plastic etc. Their use should be minimized, and should be recycled where the service exists [4].

The rules were amended twice in 2000, primarily to address administrative matters. Segregation and collection of various categories of waste should be done at the source, in separate containers so that each category is treated in suitable manner to render it harmless.

With this background, the study was conducted to assess the knowledge, attitude and practice of biomedical waste management among dental graduates in GDC&H Hyderabad.

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**Materials and Methods**

**Materials:** A total sample of 250 dental under graduates and post graduates in government dental college Hyderabad.

**Method:** Questionnaire type of study

**Questionnaire**

	Questions	Dentist response (%)
1.	Awareness of different categories Of biomedical waste generated in The clinic	
a.	Yes	213(85.2%)
b.	b) no	37(14.8%)
2.	Category of an extracted tooth	
a.	Infected	162(64.8%)
b.	Cytotoxic	22(8.8%)
c.	Infected cytotoxic	38(15.2%)
d.	Don't know	28(11.2%)
3.	Category of used needles and syringes	
a.	Category 1	40(16%)
b.	Category 2	43(17.2%)
c.	Category 4	68(27.2%)
d.	Don't know	99(39.6%)
4.	Category of outdated and contaminated medicines	
a.	Chemical waste	97(38.8%)
b.	Cytotoxic waste	75(30%)
c.	Biotechnological waste	33(13.2%)
d.	Don't know	45(18%)
5.	Category of used impression Materials and cotton	
a.	Solid waste	65(26%)
b.	Soiled waste	98(39.2%)
c.	Infected waste	58(23.2%)
d.	Don't know	29(11.6%)
6.	Awareness of biomedical waste Management law in India	
a.	Yes	180(72%)
b.	No	70(28%)
7.	Awareness of color coding for different Types of biomedical waste	
a.	Yes	180(72%)
b.	No	70(28%)
8.	Human anatomical waste should be d Disposed in	
a.	Yellow container	79(31.6%)
b.	Red container	73(29.2%)
c.	Blue/white translucent container	22(8.8%)
d.	Don't know	76(30.4%)
9.	Sharp wastes should be disposed in	
a.	Yellow container	42(16.8%)
b.	b) Red container	71(28.4%)
c.	c) Blue/white translucent container	66(26.4%)

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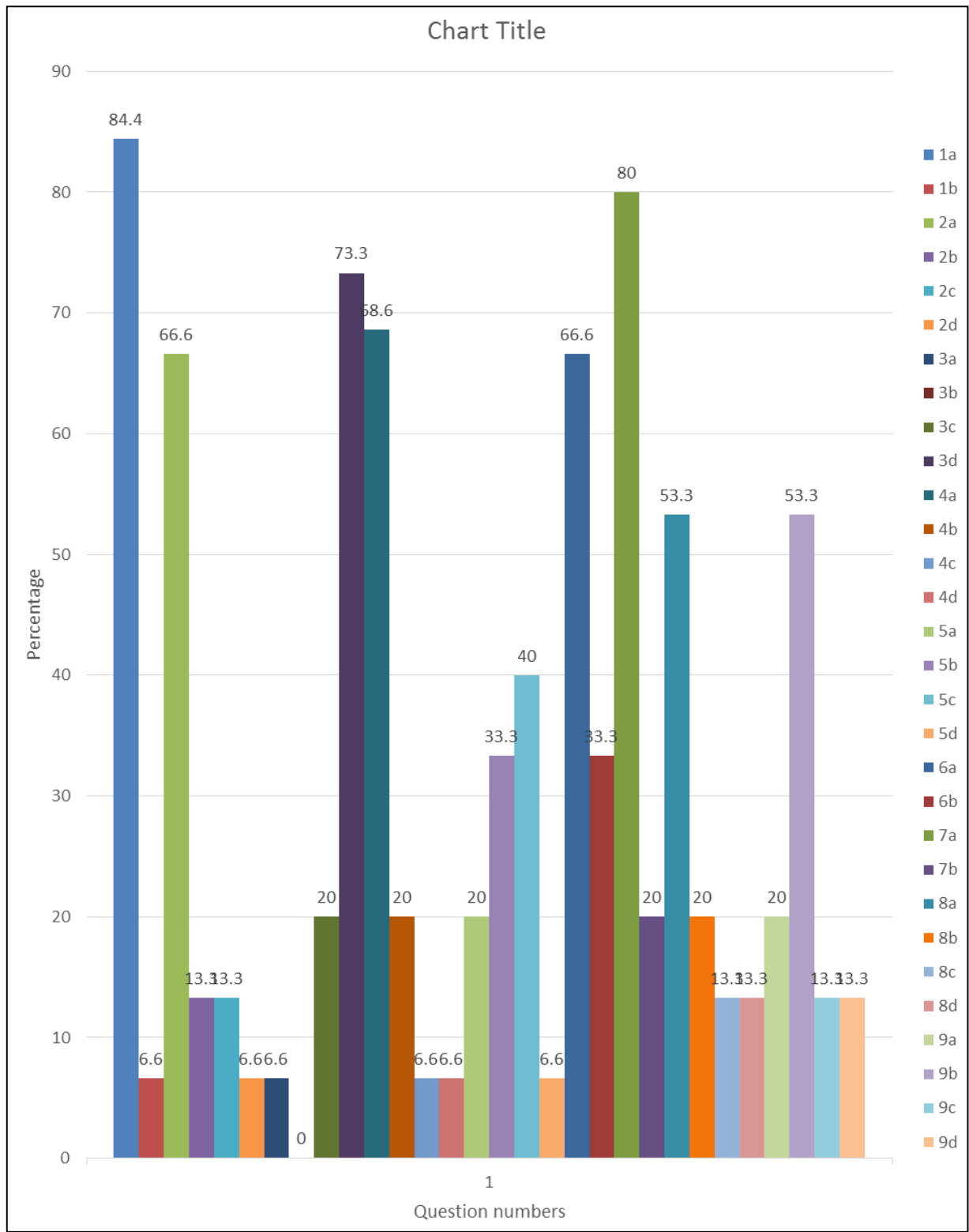
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	Questions	Dentist Response (%)
1.	Segregation of different types Of wastes	
a.	Yes	44(17.6%)
b.	No	206(82.4%)
2.	Storage of excess silver amalgam	
a.	Dispose to common bin	85(35.2%)
b.	Store in an air tight container With water	82(32.8%)
c.	Store in an air tight container	31(12.4%)
d.	Others (not using/store in fixer)	49(19.6%)
3.	Disposal of infected sharp wastes like needles	
a.	Dispose to common bin	83(33.2%)
b.	Break the needle and then dispose	100(40%)
c.	Destroy the needle with needle burner	61(24.4%)
d.	Dispose in a puncture proof Plastic bag	6(2.4%)
4.	Disposal of developer and fixer solution	
a.	Led into sewer	89(35.6%)
b.	Diluted and led into sewer	127(50.8%)
c.	Return it to the supplier	19(7.6%)
d.	Others (RVG/no unit)	15(6%)
5.	Disposal of X-ray film lead foils	
a.	Common bin	173(69.2%)
b.	Stored separately and disposed	53(21.2%)
c.	Sell to certified buyers	9(3.6%)
d.	Disposed in secured landfills	15(6%)
6.	Disposal of exposed X-ray films	
a.	Common bin	189(75.6%)
b.	Stored separately and disposed	42(16.8%)
c.	Buried in soil	9(3.6%)
d.	Disposed in secured landfill	4(1.6%)
7.	Disposal of orthodontic wires and brackets	
a.	Common bin	180(72%)
b.	Deform and disposed	62(24.8%)
c.	Sell to certified buyers	6(2.4%)
d.	Others	2(0.8%)
8.	Disposal of outdated and contaminated medicines	
a.	Common bin	170(68%)
b.	Deform and disposed	54(21.6%)
c.	Buried in soil	15(6%)
d.	Disposed in secured landfill	11(4.4%)
9.	Use of color coded bags for waste disposal	
a.	Yes	41(16.4%)
b.	No	208(83.2%)
10	Final disposal of dental care waste	
a.	Corporation bin	224(89.6%)
b.	Certified collectors	26(10.4%)

## Results

It is an important observation about 75% of the respondents considered all healthcare wastes to be hazardous. Only 85% of dental graduates are aware of different categories of biomedical waste. Only 72% of the respondents are aware of different color coding of disposing biomedical wastes. Only

32% of respondents are only aware of storage of silver amalgam. Only 33% of respondents are ware of disposal of infective sharp waste and 72% of the respondents were of the fact that biomedical waste management and handling rules were applicable to dentists.



**Discussion**

However, studies conducted in Amritsar<sup>5</sup> and Delhi revealed that the awareness in this regard was 80% and 75% respectively. Only 14% of the dental graduates opined that any plastic bag can be used for waste segregation. The observation is in contrast with the results of studies done in Chennai<sup>6</sup> were 28%. Treasure and Treasure<sup>7</sup> conducted a national survey in New Zealand in dental practices for disposal of dental waste. About 56% dental practices disposed into waste paper bins, 24.4% dispose of contaminated sharp items into general household works.

Farmer *et al.*<sup>8</sup> in their pilot study, up to 91% total waste was found to be cross infection control items such as gloves,

single use caps. Rowe *et al.*<sup>9</sup> mentioned that approximately 6% of mercury used by dental professionals in the total of annual domestic consumption and is estimated to contribute significantly to discharge of mercury into waste water streams.

AS per WHO<sup>10</sup> hospital waste produces 80-85% non-hazardous waste and 15-20% hazardous waste. According to Arenol –Bindslev<sup>11</sup>, the environment impact of amalgam use in dentistry is minimal.

Knowledge, attitude and practice act as three pillars, which make up the dynamic system of life itself. Knowledge is some information that is acquired or gained. It results in congeniality and advertence about an eclectic thing or a

situation. Knowledge, being the basic criterion that allows one to earmark between the right and wrong, is a mixture of comprehension, experience, discernment and skill. Attitude accredits to thinking towards a proper situation. Practice means contemplation of rules and knowledge that lead to action. Thus, a right knowledge, a positive attitude is imperative to guide and serve the patients <sup>[12, 13]</sup>. Thus this study was conducted with the objective of assessing the knowledge, attitude and practice regarding biomedical waste management among dental healthcare personnel.

### Conclusion

Awareness concerning management of various kinds of biomedical waste in interns and post graduate students needs to be promoted in a better way which will lead to reduction in the harmful consequences of ill-disposed hazardous waste. Safe and effective management of waste is not only legal necessity but also a social responsibility. Hence, dental students, interns, and post graduates and health care providers should always try to reduce the waste generation in day to day work in the clinic or at the hospital.

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