



## Knowledge and attitude of dental students towards biomedical waste management in two institutes of Belgaum city: A questionnaire study.

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### ABSTRACT

*Introduction: The waste generated during health care procedures carries higher potential for infection and injury than other type of waste. Inadequate knowledge about handling health care waste may have serious health consequences and impact on environment as well. The objective was to access knowledge and attitude of dental students of two institutes of Belgaum city regarding biomedical waste management.*

*Materials and methods: this was a cross-sectional study. The study was conducted among the students of two institutes of Belgaum city. Survey form was composed of 14 self administered questions based on knowledge and attitude dental students regarding biomedical waste management. The resulting data was coded and statistical analysis was done.*

*Results: Regarding the awareness of biomedical waste management 33.3% of students from KLE College were not aware of safe management of biomedical waste. Regarding the disposal of waste 56.4% of KLE and 43.6% MMDC students believe that biomedical waste should be disposed in corporation bins. Regarding Amalgam disposal 58.1% KLE and 41.9% MMDC students believe that amalgam should not be disposed in the sink and bins. 49.1% KLE and 50.9% MMDC students believe that amalgam should be disposed in photographic fixer solution. 59.3% KLE interns agree needle burner should be used for disposal of sharp wastes 83.3% of MMDC students believe that common bin should be used for disposal of sharp wastes. 56.2% of KLE and 43.8% MMDC students disagree that safe management of waste is a responsibility of practioner. 46.8% KLE and 43.2% MMDC students have knowledge about the Tendency of cross infection if biomedical waste is not handled properly.*

*Conclusion: It was concluded that not all the students were aware of safe management of biomedical waste. Further training should be included in their curriculum for safe management of biomedical waste and legal issues related to this topic.*

**KEYWORDS : Biomedical waste, crossinfection , knowledge and attitude,**

### Introduction

In the persuasion of the aim of reducing health problems, eliminating potential risks, and treating sick people, healthcare services inevitably create waste which itself may be hazardous to health. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well.<sup>1</sup>

Dental practices generate large amounts of waste such as cotton, plastic, latex, glass and other materials, most of which may be contaminated with body fluids. Dental practices also produce small amount of other types of waste, such as mercury, silver amalgam and various chemical solvents.<sup>2</sup>

Increase in the amount of biomedical waste generated in dental practice has led to increased incidence of nosocomial infections and environmental pollution. Recently documented cases concerning transmission of hepatitis B, herpes and other infectious diseases between dental patients and dental personnel, together with the public concern over human immune-deficiency virus transmission have led to close examination of infection control policies employed in dental practices.<sup>3</sup>

Another major concern in our field is management and disposal of mercury. The release of amalgam particles into dental office wastewater or in solid waste is an important concern as these particles could then be released into the environment.<sup>4</sup> Accordingly, dental clinics are playing a major role in mercury discharge.<sup>5,6</sup> If the manipulation of amalgam and its waste products are not strictly regulated, it could be responsible for environmental pollution as well as occupational exposure.<sup>7,8</sup>

So it is the duty of every occupier of a hospital or clinic generating biomedical waste to take necessary steps to ensure that such waste is handled without any adverse effect to the human health or environment. Dental health-care setups are found to generate both infectious and hazardous waste, so it is the time for us to get oriented, sensitized, and trained to manage health-care wastes scientifically.<sup>9</sup>

### Methodology

The questionnaire was designed to obtain the information about the knowledge of 100 consenting students from KLE V.K. Institute of Dental Sciences and Maratha Mandal's Nathojirao G. Halgekar Institute of Dental Sciences & Research Centre. The students were asked to indicate their views on waste management policy, practice and their attitude related to the issue. The questionnaire was self administered and close ended. The questionnaire was pilot tested on small group of students who were requested to complete it and to indicate if any question is unclear. The authenticity is pretested on a sample of dental students in the same institute to ascertain the practicability, cogency and redemption of responses.

Questionnaire elicits information on demography, perception on disposal of biomedical wastes generated during dental practice and method of disposal of mercury. Participation is voluntary and non participation in the survey does not affect the results of the study. After modification of few questions the final version of questionnaire is prepared and is distributed among students.

Questionnaire consists of three parts. First part includes socio-demographic data (name, age, gender, name of the university). Second part includes 10 questions to assess the knowledge about biomedical waste disposal and management used in dental operatory. Third part consists of 4 questions to assess the perceived attitude of students for biomedical waste management protocols.

Knowledge responses (Yes, No, Do not know) and attitude responses (strongly agree, agree, disagree) are obtained from questionnaire. Confidentiality regarding identity of participants was maintained by giving codes to the questionnaire sheet. All data management and analysis were carried out using Microsoft excel sheet.

### Results:

	COLLEGENAME	N	Mean	Std. Deviation	Std. Error Mean
TOTALSCORES	1	36	50.1944	3.99871	.66645
	2	34	53.5294	4.31513	.74004

A survey was conducted among 100 students from KLE V.K. Institute of Dental Sciences(KLE) and Maratha Mandal's Nathojirao G. Halgekar Institute of Dental Sciences & Research Centre(MMDC), out of which 70% of students have responded. Regarding the awareness of bio-medical waste management 33.3% of students from KLE College were not aware of safe management of biomedical waste. 100 %students from both the institutes agree that color coding and waste segregation before disposal is necessary.

Regarding the disposal of waste 56.4% of KLE and 43.6 % MMDC students believe that biomedical waste should be disposed in corporation bins. 66.8% of respondents from KLE and 33.3% of MMDC reported that authorised waste collection was done by bio management Waste agencies.

Regarding Amalgam disposal 58.1%KLE and 41.9% MMDC students believe that amalgam should not be disposed in the sink and bins. 49.1% KLE and 50.9%MMDC students believe that amalgam should be disposed in photographic fixer solution. Whereas 32.1% KLE and 67.9% MMDC student said that proper recycling method should be followed for amalgam disposal.

In present study majority of students were aware of knowledge about colour coding of container, sharp waste disposal and contaminated and out dated medicines. Knowledge about the colour coding of containers and waste segregation is an important pivotal point.59.3% KLE students agree needle burner should be used for disposal of sharp wastes 83.3% of MMDC students believe that common bin should be used for disposal of sharp wastes.

Students from both the institutes are not aware of legal issues involved in the management of biomedical waste. 56.2% of KLE and 43.8%MMDC students disagree that safe management of waste is a responsibility of practioner. 46.8%KLE and 43.2%MMDC students have knowledge about the Tendency of cross infection if biomedical waste is not handled properly. The students strongly agree that infections like Hepatitis and HIV can spread if proper waste disposal measures are not practiced.

#### Discussion:

Poor waste management practices pose huge risk for the health of public, patients and professionals and contribute to environmental degradation.US medical waste tracking system found that dentist generate only 3% of total medical waste.Govt of India under it's gazetted notification from ministry of environment and forests informed that no biomedical waste should be disposed in public bins which in turn may harm waste collectors if they are not appropriately protected.

The study was conducted on predesigned and pretested questionnaire, a cross-sectional study design was selected as similar design was selected in other studies. According to our study most of students from both the institutes were aware of safe management of biomedical waste.100% of students from both the institutes were aware that color coding and segregation is required before disposal of biomedical waste.

Safe management of dental health care waste has been agreed to be an issue by half of the students from both institutes.56.4% of KLE and 43.6 % MMDC students believe that biomedical waste should be disposed in corporation bins . 66.6% of KLE and 33.3% of MMDC students believed that biomedical waste should be managed by authorised waste agencies. Whereas in the study conducted by Sudhaker et al about 33.4% handle it over to certified agencies.

Almost 100% of students from both the institutes were aware of health hazard associated with the mercury. The health risk is clearly greater for members of dental office than the patients.ADA specifications recommended storing scrap amalgam from restorative procedures under water ,glycerine or spent X-ray fixer solution in tightly capped jar.58.1%KLE and 41.9% MMDC students believe that amalgam should not be disposed in the sink and bins. 49.1% KLE and 50.9%MMDC students believe that amalgam should be disposed in photographic fixer solution. In survey done by Sudhakar and Chandrashekar in which only 40.6% of the dentists get rid of

the excess silver amalgam into common bin which is similar to the study conducted by Sudhakar and Chandrashekar and Al-Khatib et al.<sup>11,12</sup>

Concern about mercury entering the municipal sewage lines are proven, ADA recommends intra office recapture systems i.e. separators with filters, mercury plating approaches ,ion exchange technology to limit the amount of mercury that enters the sewage. Majority of MMDC students believe that proper recycling of amalgam waste should be done.

In present study when students were asked about color coding for different categories of biomedical waste, only 33% students were aware of the color coding given for disposal of sharp needles and 50% for outdated medicine. 40% of students are not aware of color coding given for disposal of gloves ,50% students about cotton and blood contaminated wastes. Contaminated sharp instruments must also should be considered to constitute special hazard, 59.3% KLE students believe that needle burner should be used for safe disposal of needles while 83.3% of MMDC students said that needles should be disposed in the bins. But in a study conducted by E. T. Treasure and P. Treasure in New Zealand, only 24.4% dispose of it by throwing into common bin.

56.2% of KLE and 43.8%MMDC of the students from both institutes are not aware of legal issues related to biomedical waste management. While in a study conducted by Sudhakar et al in Bangalore and Kishore et al in New Delhi, only 57% and 36%, respectively, were aware of the biomedical waste management and handling law in India.<sup>10,11</sup>

Safe management of dental health care waste is an issue that requires team work from both dentists and government. 56.2% of KLE and 43.8%MMDC students disagree that safe management of waste is a responsibility of practioner. Knowledge about the potential spread of contagious diseases such as Hepatitis B and HIV if safe management of biomedical waste is not done. 46.8%KLE and 43.2%MMDC students have knowledge about the Tendency of cross infection if biomedical waste is not handled properly.

The validity and reliability of questionnaire-based surveys can be influenced by design, question content, analysis, and response rates. The advantages of using a questionnaire as a data collecting method was to quickly and inexpensive response from the respondents.<sup>9</sup>

#### Conclusion:

Within the limitation of this study it can be concluded that not all the students were aware of the risks they were exposed to and only half of them were aware of safe disposal of biomedical waste. In addition to this students were not aware of recycling of waste and legal issues concerned with safe disposal of biomedical waste. Strict implementation of biomedical waste management rules is a need of the hour, it should be made compulsory for health care institutes to get their students to be trained from accredited centres and training should not be one time activity but should be continuous process. It is a time that medical,paramedical and dental education give due importance to this vital issue, for proper management biomedical waste.

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