International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 5, May 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.5.2025.13

ORIGINAL RESEARCH

Awareness of Biomedical Waste Management among Dentists and Dental Assistants in Dental Hospitals

Dr. Tejaswini Ramisetty[1], Dr. P.Sri Lalitha[2]

[1]BDS, Fellowship in Clinical Dentistry, Fellowship in Minor Oral Surgery, India
[2]MDS, Oral and Maxillofacial Surgery, Hyderabad, India

Corresponding Author
Dr. Tejaswini Ramisetty
BDS, Fellowship in Clinical Dentistry, Fellowship in Minor Oral Surgery, India
Email: tejaswiniramisetty@gmail.com

Received: 27 March, 2025 Accepted: 22 April, 2025 Published: 01 May, 2025

ABSTRACT
Bio-medical waste (BMW), defined as "any waste generated during the diagnosis, treatment or immunization of human beings or animals or in research activities used in the production or testing of biologicals." The aim of the present study is to gather the level of knowledge, awareness, attitude about Bio Medical Waste Management among the various general dentists and their assistants. The study was conducted with the help of a cross sectional questionnaire through Google Forms. The results were analysed statisticallyby using SPSS software. Among 100 responses, 90% of the respondents followed the protocol; while the remaining 10% failed to correctly practise the protocols. It indicates that there is a need to train the dental personnel regarding the same all around the country. There is a high need to urge awareness about the management of biomedical waste as inadequate and inappropriate knowledge of handling these wastes can have serious implications on the society as a whole. These bio medical wastes can cause serious hazards to health and the environment.

INTRODUCTION

Health care processes generate lots of biomedical waste which is hazardous to humans and the environment. It is a major threat if there are poor biomedical waste management practices, which is a huge risk to the health of the general population, patients and healthcare professionals and their assistants.[1] Definition of biomedical waste as per Biomedical Waste (Management and Handling) Rules, 1998 of India "Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto in the production or testing of biological".[2] In layman terms biomedical waste management means any waste that is generated during the process of diagnosis, treatment, and immunization of humans and/or animals. The wastes are generated not only in diagnosis, treatment and/or immunisation but also during research or production or testing of biological materials. These wastes could be potentially health hazardous and cause damage to the environment if it is not managed properly. All hospitals and clinics are continuously at risk of potentially fatal infections like HIV (human immunodeficiency virus), HBV (hepatitis B) and HBC (hepatitis C) and many more. To avoid this, a careful waste management system should be implemented in clinics and hospitals.[3] Dental hospitals normally use instruments and materials that are directly exposed to blood and saliva which are considered to be the potential sources of infections. These include the sharps materials, used disposable items, infectious waste such as blood soaked cotton, gauze etc, lead containing wastes like lead foil packets and chemical wastes such as spent film developers, fixers, disinfectants etc. (Deroos, 1974).[4] In the past relatively few studies were conducted, among which a poor to good level of awareness of waste disposal were reported (Patil and Pokhrel, 2005).[5] From the implementation of the biomedical Waste Management rules1998, every concerned health authority must have significant knowledge, practice and capacity to guide others for the waste collection and management and proper handling techniques (Saraf et al., 2006).[6]The rules were amended twice in the year 2000,which made it mandatory for the health care establishments to segregate ,disinfect and dispose of their waste in an eco friendly manner. The most important prerequisite and keys to the successful waste management program is segregation which is

DOI: 10.69605/ijlbpr_14.5.2025.13

the separation of different types of waste as per the treatment and disposal option. For effective waste management, the waste must be managed at every step, from acquisition to disposal (Sudhakar and Chandrashekar, 2008).[7] The significance of this study is to understand the awareness among the dentists and their assistants regarding the Bio Medical Waste(BMW) Management practices,policies and to assess their attitude towards it.

AIM

The aim of the present study is to determine the awareness of biomedical waste management practices and policies among dental professionals and Assistants.

METHODS

This study was conducted among dental clinicians and assistants among various dental clinician the month of January 2025. Fifteen self-administered questionnaires were created and dispersed among the participants via an online Google Forms link**.** These questionnaires are designed to assess the knowledge of dental professionals and their assistants about methods, benefits, and values with respective biomedical waste management. A total of 100 responses were received.

RESULTS

Among 100 responses, 90% of the respondents followed the protocol; while the remaining 10% failed to correctly practise the protocols.

For the question “are there any particular guidelines for biomedical waste management?” 91% answered yes and the remaining 9% contains answers no and don’t know. For the question “Is there any biomedical waste disposal policy in your Hospital/Clinic?” 80% answered yes 15% answered no and the remaining 5% didn't know. For the question “Can improper waste management cause various health hazards?” 95% answered yes and the remaining 5% answered didn't know. 99% answered yes, 1% answered didn't know for the question “Is maintaining biomedical waste mandatory in clinics?”. 80% answered no, 20% answered no and didn't know for the question “Should there be regular educational programs on biomedical waste management?” “Are different coloured bags used to dispose of different types of wastes?” for this question 98% answered yes and 2% answered no and didn't know. 35% answered red bags, 50% answered yellow bags and 15% answered blue or white translucent bags for question “Extracted teeth and human tissues are disposed in”. 20% answered red bags, 60% answered yellow bags and 20% answered black bags for question “Used impression materials and soiled dressings are disposed in”. 10% answered red bags, 40% answered yellow bags and 50% answered blue or white translucent bags for question “Used disposable plastics are disposed in”. 50% answered red bags, 35% answered yellow bags and 15% answered blue or white translucent bags for question “Used sharps and needles should be disposed in?”. 21% answered yellow bags, 40% answered black bags and 39% answered blue or white translucent bags for question “Metallic body implants are disposed in. 30% answered yellow bags, 50% answered black bags and 20% answered blue or white translucent bags for question “Medicines and cytotoxic drugs are discarded in”. 45% answered red bags, 55% answered yellow bags for question “Gloves are disposed in”.

Table 1.Biomedical Waste Disposal Colour-coding[11]

Colour-Coding	Type of container	Waste category
Yellow	Plastic Bag	Human and animal waste, Impression material
Red	Plastic Bag	Solid waste, Disposal items other than sharps items
Blue/White translucent	Plastic Bag	Sharps Waste
Black	Plastic Bag	Discarded medicines and Cytotoxic drugs

DISCUSSION

Training the healthcare professionals and their assistants for effective biomedical waste management is a very important because It is the responsibility of health care providers to protect the environment and health.[8,9]Biomedical waste is of main concern due to the presence of pathogens , including strains of viruses and bacteria and their substances which adversely affects the human health and surrounding environmen.[8] Dental practice involves exposure to many hazardous materials which calls for proper segregation and disposal of biomedical waste.[10] As per National guidelines of biomedical waste rules propagated by Government of India, waste must be disposed of in different colour coded bags[11] as mentioned in below Table 1. Findings from the present study shows that segregation of waste is an important step in the BMW management chain, where 91% study subjects mentioned that they knew guidelines for biomedical waste management. These findings were in accordance with a study conducted by Rajiv Sainiet al.[12], where majority 94% participants knew the guidelines for biomedical waste management. A study conducted by Priyaranjanet al.[10] showed that there was a very high difference between knowledge and practice of dental professionals regarding waste management, same results were obtained in the present study. A systematic review conducted by D Kapooret al.[13], found that knowledge and awareness level of dental students was inadequate

DOI: 10.69605/ijlbpr_14.5.2025.13

and there is considerable variation in practice and management regarding BMW; same outcomes were observed in the present study. The finding of this study suggests an urgent need to educate and train dental professionals in dental clinics and hospitals. Furthermore, suggested that a proper acceptable waste management educational programme must be included in the dental educational curriculum to give vital importance to this issue. Further studies are required on a large population to generalise the results in articulation and implementation of biomedical waste guidelines. The results of the study will help develop a strategy for improving better biomedical waste management in dental clinics.

CONCLUSION

From the present study it is concluded that regular training in biomedical waste management should be given for dental professionals and their assistants.

REFERENCES

1. Hiltz M. The environmental impact of dentistry. J Can Dent Assoc 2007; 73: 59–62.
2. Ministry of Environment & Forests (MoEF) Government of India. The Grants Register 2019; 506–506.
3. Rudraswamy S. Hospital waste management training among the staff of dental teaching hospitals in Bangalore city: Hospital waste management. Anchor Academic Publishing 2014.
4. Deroos, r. l. Environmental concerns in hospital waste disposal', Hospitals, 1974;48(4),88-92Available at: https://www.ncbi.nlm.nih.gov/pubmed/4813050.
5. Patil, G. v. and Pokhrel, K. Biomedical solid waste management in an Indian hospital: a case study', Waste management, 2005;25(6):592–599. doi: 10.1016/j. wasman.2004.07.011.
6. Saraf, Y. et al. Study of awareness status about hospital waste management among personnel and quantification', Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine, 2006;31(2):111. Available at: http:// medind.nic.in/iaj/t06/i2/iajt06i2p111.pdf.
7. Sudhakar v. and Chandrashekar. Dental health care waste disposal among private dental practices in Bangalore City, India', International dental journal, 2008;58(1):51–54. doi: 10.1111/j.1875-595x.2008. tb00176.x.
8. Surabhi M, Shivakumar K.M, Vidya K. Knowledge, attitude and practices of biomedical waste management among dental practitioners in Karad City, Maharashtra, India. Indian Journal of Public Health Research & Development, January 2020, Vol. 11, No. 01
9. Rasheed S, Iqbal S, Baig LA, Mufti K. Hospital waste management in the teaching hospitals of Karachi. J Pak Med Assoc 2005;55:192-5.
10. Priyaranjan, Mago HS, Pandey S, Mishra A. Awareness of Dental Health Care Waste Management among Dentists- A Cross Sectional Study. J Adv Med Dent Scie Res 2019;7(10): 73-76.
11. Sanjeev R, Kuruvilla S, Subramaniam R, Prashath PS, Gopalakrishnan M. Kowledge,attitude, and practices about biomedical waste management among dental healthcare personnel in dental colleges in Kothamangalam: A cross sectional study. HelathSci 2014;13:1-12.
12. Rajiv Saini et al. Knowledge of biomedical waste management among the students of rural dental college, Maharashtra, India. International Journal of Experimental Dental Science, January-June 2013;2(1):24-26
13. DaljitKapoor, AshutoshNirola, VinodKapoor, Ramandeep-Singh Gambhir. Knowledge and awareness regarding biomedical waste management in dental teaching institutions in India- A systematic review.JClinExp Dent. 2014;6(4):e419-24.