

Knowledge, Attitude and Practices among Dentists regarding Bio-Medical Waste Management in Ahmedabad City, Gujarat: A Questionnaire Based Study

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ABSTRACT

Aim: To access Knowledge, attitude and practices among dentists regarding bio-medical waste management in Ahmedabad city, Gujarat. **Materials and Methods:** The present cross sectional questionnaire study was conducted in Ahmedabad city. The study sample included 120 graduate and postgraduate practitioners. The survey was scheduled to spread over a period of 3 months. Data was collected by using self designed questionnaire. Collected data was coded, compiled and tabulated. The data was analyzed by using appropriate statistical analysis. **Results:** There exists quite a lot of variation in the responses obtained from graduates and postgraduates on the various aspects of bio-medical waste management. Also it was observed that the majority of the practitioners were having good knowledge regarding bio-medical waste management, whereas their attitude towards the same was found little low which is an alarming condition and they were doing fair practice of the same. **Conclusion:** The participants had variable and inconsistent knowledge about biomedical waste management. The views of the participants varied considerably, as inferred by the results.

KEYWORDS: Ahmedabad; Bio-Medical Waste; Graduates; Postgraduates; Waste Management

INTRODUCTION

Biomedical waste (BMW) is usually generated during various activities like diagnosis, treatment, immunization or research activities.^{1,2} BMW is different from the hospital waste. It consists of various solid, liquid or fluid components including intermediate products. These products are basically the result of diagnostic, treatment or research activities.^{2,3} As compare to other types of wastes, the waste produced during biological and healthcare procedures is more infectious. BMW should be handled carefully. People should be educated about proper handling of the biomedical waste. Inadequate knowledge and hence improper handling may have serious effect on health as well as environment.⁴

Dental waste is a subset of hazardous biomedical (BM) waste. It includes various materials like cotton, sharps, extracted teeth etc. which are usually contaminated with body fluids like blood and saliva.^{5,6} Dental waste can also have two types of effects i.e. the environmental and on the health of the person handling the waste.^{6,7} Though India has well-established protocols for handling and management of biomedical wastes, namely, the BMW (Management and Handling) Amendment Rules, 2000,

but still there is a great lack of knowledge, attitude and practice of proper waste management among various healthcare professionals.^{8,9,10,11,12}

Thus, with this background the present study was undertaken with to access the knowledge, attitude and practices among dentists regarding bio-medical waste management in Ahmedabad city.

MATERIALS AND METHODS

The present cross-sectional questionnaire based study was conducted in Ahmedabad city. The study sample included a total of 120 private dental practitioners; 70 were graduates, and 50 were postgraduates. The selection of the sample for the study was carried out in two steps by using multistage random sampling technique. In the first stage, the Ahmedabad city was divided into four zones: North, West, East, and South. To make the sample more representative 30 Dentists from each zone were selected randomly. The survey was scheduled to spread over a period of 3 months. First the purpose of the study was explained and then the informed consent was obtained from each participant who was willing to

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participate in the study. A questionnaire (Annexure I) related to biomedical waste consisting of multiple choices was given to each participant, and the response sheets were collected after a week. The questions were framed in three sets; knowledge, attitude and practices of dentists in relation to Bio-medical waste management. The data was collected by the single investigator.

Statistical analysis: Collected data was coded, compiled and tabulated. The data was then analyzed by applying descriptive and inferential statistical analysis. Analysis was carried out using SPSS package version 17 (SPSS Inc., Chicago, IL, USA).

RESULTS

Table 1 depicts data on knowledge assessment of participants regarding various aspects of bio-medical waste management. Table 2 depicts data on attitude assessment of participants regarding various aspects of

Knowledge Assessment			
Question number	Answer	Graduates	Post Graduates
1	Yes	52 (92.8%)	41 (93.2%)
	No	02 (3.6%)	02 (4.5%)
	Yes	52 (92.8%)	41 (93.2%)
2	Yes	48 (85.7%)	36 (81.9%)
	No	08 (14.3%)	07 (15.8%)
	Don't Know	00 (00%)	01 (2.3%)
3	Dump directly into garbage bins	07 (12.5%)	07(15.9%)
	Handing it over to garbage collectors	10 (17.9%)	8(18.8%)
	Handing it over to Biomedical waste management agency	39 (69.6%)	28(63.6%)
	Other methods	00 (00%)	01(2.3%)
4	Yes	45 (80.4%)	33 (75%)
	No	11 (19.6%)	07 (15.9%)
	Don't Know	00 (00%)	04 (9.1%)
5	Yes	49 (87.5%)	42 (95.5%)
	No	05 (8.9%)	02 (4.5%)
	Don't Know	02 (3.6%)	00 (00%)

Table 1: Depicts data on knowledge assessment of study subjects

Attitude Assessment			
Question number	Answer	Graduates	Post Graduates
1	Yes	13 (23.2%)	10 (22.7%)
	No	43 (76.8%)	34 (77.3%)
2	Yes	35 (62.5%)	35 (79.5%)
	No	21 (37.5%)	09 (20.5%)
3	Yes	50 (89.3%)	37 (84.1%)
	No	06 (10.7%)	07 (15.9%)
4	Yes	18 (32.1%)	12 (37.3%)
	No	38 (67.9%)	32 (72.7%)
5	Yes	16 (28.6%)	13 (29.5%)
	No	40 (71.4%)	31 (70.5%)
6	Yes	12 (21.4%)	10 (22.7%)
	No	44 (78.6%)	34 (77.3%)
7	Yes	43 (76.8%)	39 (88.6%)
	No	13 (23.2%)	05 (11.4%)

Table 2: Depicts data on assessment of study subjects

bio-medical waste management. Table 3 depicts data on practice assessment of participants regarding various aspects of bio-medical waste management. It is very clear from the above tables that there is quite a lot of variation in the responses obtained from graduates and

postgraduates on the various aspects of bio-medical waste management. Table 4 depicts data on overall knowledge, attitude and practice of study subjects. From the Table 4 it becomes clear that the majority of the practitioners were having good knowledge regarding bio-medical waste management, whereas their attitude towards the same was found little low which is an alarming situation, and they were doing fair practice of the same.

Practice Assessment			
Question number	Answer	Graduates	Post Graduates
1	0-2 kgs	33 (58.9%)	25 (56.8%)
	>2-4 kgs	19 (33.9%)	15 (34.1%)
	>4 kgs	04 (7.2%)	01 (2.8%)
2	Yes	33(58.9%)	31 (70.5%)
	No	23(41.1%)	13 (29.5%)
3	Yes	38 (67.8%)	33 (75%)
	No	16(28.6%)	08 (18.2%)
	Don't Know	02 (4.5%)	03 (6.8%)
4	Yellow	08 (14.3%)	01 (2.3%)
	Red	18(32.1%)	22(50%)
	Black	17 (30.4%)	05(11.3%)
	Don't know	13(23.2%)	16(36.4%)
5	Yellow	15(26.8%)	18 (40.9%)
	Red	12(21.4%)	08(18.1%)
	Blue	25 (44.7%)	13(29.5%)
	Don't know	04(7.1%)	05(11.5%)
6	Yellow bags	29(51.8%)	27 (61.4%)
	Red bags	12(21.4%)	10(22.7%)
	Black bags	09 (16.1%)	03(6.8%)
	Don't know	06(10.7%)	04(9.1%)

Table 3: Table 3: Depicts data on practice assessment of study subjects

Overall knowledge			
Subject	Good	Fair	Poor
Graduates	43 (76.8%)	10 (17.9%)	03 (5.3%)
Post Graduates	34 (77.3%)	10 (22.7%)	00 (0.0%)
Overall attitude			
Subject	Good	Fair	Poor
Graduates	13 (23.2%)	38 (57.9%)	05 (8.9%)
Post Graduates	22 (50.0%)	19 (43.2%)	03 (6.8%)
Overall practice			
Subject	Good	Fair	Poor
Graduates	19 (33.9%)	24 (42.9%)	13 (23.2%)
Post Graduates	18 (40.9%)	23 (52.3%)	03 (6.8%)

Table 4: Depicts data on overall knowledge, attitude and practice of study subjects

Annexure I

Questionnaire

Qualification: BDS/MDS

Years of Experience:

Knowledge Assessment

1. Can improper waste management cause various health hazards?
 [A] Yes [B] No [C] Don't know

2. Are there any guidelines laid down by Government of India for BMW management?
 [A] Yes [B] No [C] Don't know

3. Disposal of healthcare waste?
 [A] Dump directly into garbage bins
 [B] Handing it over to garbage collectors
 [C] Handing it over to Bio-medical waste management agency
 [D] Other methods

4. Is maintaining BMW records mandatory in your hospital/clinic?
 [A] Yes [B] No [C] Don't know

5. Does improper waste management cause Environmental problems?
 [A] Yes [B] No [C] Don't know

Attitude Assessment

1. Safe management of health care waste is not an issue at all?
 [A] Yes [B] No

2. Safe management of health care waste is the responsibility of government?
 [A] Yes [B] No

3. Waste management is team work/no single class of people is responsible for safe management?
 [A] Yes [B] No

4. Safe management efforts by hospital increases financial burden on management?
 [A] Yes [B] No

5. Safe management of Health Care waste is an extra burden on work?
 [A] Yes [B] No

6. Have you undergone any training programme on hospital waste management?
 [A] Yes [B] No

7. Would you like to attend a programme on Hospital Waste Management?
 [A] Yes [B] No

Practice Assessment

1. Amount of healthcare waste generated per day?
 [A] 0-2 kgs [B] >2 - <4 kgs [C] > 4 kgs

2. Practice of segregation before disposal?
 [A] Yes [B] No

3. Are different coloured bags used to dispose different types of waste?
 [A] Yes [B] No [C] Don't know

4. Excess mercury/amalgam produce in clinic are disposed in which container?
 [A] Yellow [B] Red [C] Black [D] Don't know

5. Used sharps and needles are disposed of in which container?
 [A] Yellow [B] Red [C] Blue [D] Don't know

6. Extracted teeth and human tissues are disposed of in:
 [A] Yellow bags [B] Red bags [C] Black bags [D] Don't know

doctors and nurses. 30% of the doctors and 20% nursing staff had more than 70% knowledge about biomedical waste management. 100% doctors and 60% nurses had a positive attitude towards biomedical waste management.

A similar study was conducted by Chandrashekar J¹⁵ to assess the knowledge, attitude and behaviour of private dental practitioners on health care waste management in Bangalore City. The study was cross-sectional and involved a self-administered questionnaire for 432 private dental practitioners. 389 dentists responded; 64.3% do not segregate waste before disposal and 47.6% hand over health care waste to street garbage collectors; 42.1% felt that there was a lack of waste management agency services and 16.9% felt that a lack of knowledge were the main hurdles.

Another similar study was done by Nirupama N¹⁶ among nursing, technical and housekeeping staff. The study involved data collection from 47 private hospitals and nursing homes in Karimnagar town of Andhra Pradesh. The study revealed that 95.8% of subjects had knowledge about the health hazards. Only 1.6% of study subjects had knowledge about the 10 categories of BMW. The study also revealed that 47.2% of Nurses, 26.4% of Technicians and 26% of housekeeping staff were having positive attitude towards BMW management ($P < 0.05$, significant).

So it's very clear from the various studies present in the literature that there is a great lack of knowledge, attitude and practices of effective BMW management amongst the staff. It's a very alarming situation which needs immediate and comprehensive steps to train and educate the staff regarding proper biomedical waste management.¹⁷ Before starting any training program, it's important to know the exact deficiencies and should be worked accordingly.¹⁸

DISCUSSION

Though healthcare services are for the benefits of the people, but sometimes these itself pose a serious hazards to health by creating waste.⁴ According to the Bio-medical Waste Rules 1998, it is must that the related health care personnel should have a proper knowledge and practice of handling as well as disposal of biomedical waste. But due to laxity in implementation of the rules and inadequate training of health care personnel, there is an indiscriminate disposal of bio-medical waste.¹³ The accuracy of a self-administered questionnaire based study mainly depends upon the way questions are formatted, its analysis and the response rate. In this study for increasing the accuracy rate and to prevent bias, most of the questions asked were of closed-end type. These type of questions are easy to analyze and gets a good response from participants.⁶ Interestingly, it was found in this study that the awareness and proper practice of biomedical waste management was not satisfactory which is correlating with the study of Sachan R *et al.*¹⁴, who conducted a study to understand the awareness of biomedical waste management practices amongst the

CONCLUSION

Optimal waste management is actually multifactorial. Usually attenders are responsible for spearheading the waste management initiatives.¹⁸ The need of the hour is to conduct training and retraining workshops on bio-medical waste management so as to improve the overall knowledge, attitude and practice towards BMW.

REFERENCES

1. Das NK, Prasad S, Jayaram K. A TQM approach to implementation of handling and management of hospital waste in Tata Main Hospital. Issued by Hospital Waste Management Committee, TMH. 2001;11-12:75-8.
2. Singh GP, Gupta P, Kumari R, Verma SL. Knowledge, attitude and practices regarding biomedical waste management among healthcare personnel in Lucknow, India. *Indian J Clin Pract* 2014;24:830-33.
3. Satpathy S, Pandhi RK. Manual for Hospital Waste Management at AIIMS Hospital, New Delhi, 1998.
4. Mathur V, Dwivedi S, Hassan MA, Misra RP. Knowledge, attitude, and practices about biomedical waste management among healthcare personnel: A cross-sectional study. *Indian J Community Med* 2011;36:143-5.

5. Schaefer ME. Hazardous waste management. *Dent Clin North Am* 1991;35:383-90.
6. Sharma A, Sharma V, Sharma S, Singh P. Awareness of biomedical waste management among health care personnel in Jaipur, India. *Oral Health Dent Manag* 2013;12:32-40.
7. Turnberg WL, Frost F. Survey of occupational exposure of waste industry workers to infectious waste in Washington State. *Am J Pub Health* 1990;80:1262-4.
8. Sanjay Kini B , Kumar A , Kumar S , Reddy M, Nabar AS, Kamath VG, et al. Knowledge, attitude and practices regarding biomedical waste management among staff of a tertiary healthcare centre in coastal Karnataka. *J Pub Health Med Res* 2014;2:20-4.
9. Pattnaik S, Reddy MV. Assessment of municipal solid waste management in Puducherry (Pondicherry), India. *Resour Conserv Recy* 2010;54:512-20.
10. Verma LK, Mani S, Sinha N, Rana S. Biomedical waste management in nursing homes and smaller hospitals around Delhi. *Waste Manag* 2008;28:2723-34.
11. Kumar S, Bhattacharyya JK, Vaidya AN, Chakrabarti T, Devotta S, Akolkar AB. Assessment of the status of solid waste management in metro cities, state capitals, class I cities, and class II towns in India: An insight. *Waste Manag* 2009;29:883-95.
12. Pandit NB, Mehta HK, Kartha GP, Choudhary Sk. Management of biomedical waste: Awareness and practices in a district of Gujarat. *Indian J Public Health*. 2005;49:245-7.
13. Ismail IM , Kulkarni AG, Kamble SV, Borker SA, Rekha R, Amruth M. Knowledge, attitude and practice about bio-medical waste management among personnel of a tertiary health care institute in Dakshina Kannada, Karnataka. *Al Am een J Med Sci* 2013;6:376-80.
14. Sachan R, Patel M, Nischal A. Assessment of the knowledge, attitude and practices regarding biomedical waste management amongst the medical and paramedical Staff in tertiary health care centre. *Int J Sci Res* 2012;2.
15. Chandrashekar J. A cross-sectional study to assess the knowledge, attitude and behaviour of private dental practitioners on health care waste management in Bangalore City. *Int Dent J* 2008;58:51-4.
16. Nirupama N. A study to assess Knowledge, Attitude and Practices about Biomedical waste management among nursing, technical and housekeeping staff in Karimnagar town of Andhra Pradesh. 2nd National Conference On Students' Medical Research (2009).
17. Saini S, Nagarajan SS, Sharma RK. Knowledge, Attitude and practices of bio-medical waste management amongst staff of a tertiary level Hospital in India. *J Acad Hosp* 2005;17:54-9
18. Rudraswamy S, Sampath N, Doggalli N. Staff's attitude regarding hospital waste management in the dental college hospitals of Bangalore city, India. *Indian J Occup Environ Med* 2012;16:75-8.

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