

Knowledge, Attitude and Practices of Dental Surgeons about Dental Waste Management in Dental Clinics of Karachi



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OBJECTIVE: This study aims to assess the contemporary situation of dental waste management in private dental practices in Karachi.

METHODOLOGY: A cross-sectional study was done in 5 districts of Karachi (East, West, South, Centre, Malir) from 26th January to 26th April 2021. Total 100 private dental practitioners were recruited using non-probability consecutive sampling. A pretested, 20 items questionnaire was used for recording data of the research participants, and their knowledge, attitude and practices (KAP) of managing dental waste. Inclusion criteria was both male and female dentists, above 25 years of age, who run dental clinics in 5 districts of Karachi. Dental students were excluded. Data were analysed using SPSS version 17.00

RESULTS: Total 79% of the participants were males and 21% were females. Approximately 68% belonged to the age group of 25-35 years. Total 51% had an experience of 10-20 years and 32% were using colour coded bins while 35% were following segregation methods for waste disposal. Only 16% had attended professional training programs for waste management.

CONCLUSION: Waste management in dental clinics in Karachi is inadequate and improper. The government should enact monitoring of all dental practices, enforcing the recommended regulations.

KEYWORDS: Dental waste management, Knowledge, attitude and practices (KAP), private dental practitioners

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INTRODUCTION

According to WHO, healthcare waste is defined as 'any disposed material from healthcare activities, which can be a potential source of infection to humans'.¹ The infectious biomedical waste produced in Pakistan is not less as compared to other countries.² Literature shows that approximately 2 kg of waste per bed per day is produced out of which 0.1- 0.5 comprises of risk waste.³

Dental clinics make up a minute amount of healthcare waste in comparison to hospitals. Still, this waste poses

grave health and environmental risks if not appropriately managed.⁴ Most of the waste produced by dental practices is classified into three groups i.e. infectious, chemical and office.⁵ Hazardous dental waste includes mercury in amalgam, silver, lead, X-ray films and fixer solution, disinfectants, needles, blades, burs, orthodontic appliances, contaminated gauze and latex gloves etc.⁵ Exposure to infectious biomedical waste can result in dermatological, gastrointestinal, respiratory diseases or worse Hepatitis and HIV / AIDS.⁶

In order to minimize hazardous outcomes of dental waste, there should be proper waste segregation, handling, transport and disposal. There is limited awareness of handling biomedical waste in third world countries.² Therefore, professional training for waste management is required for the betterment of knowledge and practices of medical and dental healthworkers.²

The research aimed to appraise the existing situation of waste management in private dental practices in Karachi

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to assess the severity of the situation and also come up with recommendations for the government to implement in order to minimize exposure and also lead to the safe management of hazardous waste substances.

METHODOLOGY

A cross sectional study was done in 5 districts of Karachi (i.e. East, West, South, Centre, Malir) for three months, from 26th January 2021 to 26th April 2021. 100 private dental practitioners were recruited for the study using non-probability consecutive sampling. The sample size was calculated using Raosoft software with the accepted margin of error 5%, 95% confidence level, population size of 134 and response distribution of 50%. Ethical approval was acquired from the Ethical Review Committee of the KMDC. Informed consent was taken from all the research participants. A pre-tested, automated, 20 items questionnaire with closed-ended questions was designed for recording data relating to participants' demographics and their relevant knowledge and practice of waste handling in dental practices. Pretesting was carried out on 20 doctors for validity. Total 100 private practitioners were given questionnaires which were duly completed and collected.

Both male and female dentists, 25 years of age and above, running dental practices in 5 districts of Karachi were included in the study. Dental students were excluded. Data collected were analyzed using SPSS software version 17.00

RESULTS

Total 100 dentists were invited and participated in this study, with a 100% response rate. The male to female ratio of the practitioners was 1: 3.8 male to female. Among respondents 10% were house officers 55% were general dental practitioners 15% postgraduate trainees and 15% were consultants.

Figure 2 shows the distribution of dental practitioners in 5 districts of Karachi.

Table 3 shows the distribution of respondents by their understanding, inclination and practices.

35% participants were following segregation methods of waste disposal, 58% were not and 7% were unaware. In this study we found that most of the practitioners improperly dispose infectious and sharp waste. 70% had no dental waste management policy document and 74% participants did not attend any CDE programs on dental waste management.

76% clinics disposed final dental waste directly into corporation bins, 14% handed it over to certified collectors

A total of 100 participants were recruited for this study, with a 100% response rate. As shown in Fig. 1, the male to female ratio of the practitioners was 1: 3.8 male to female.

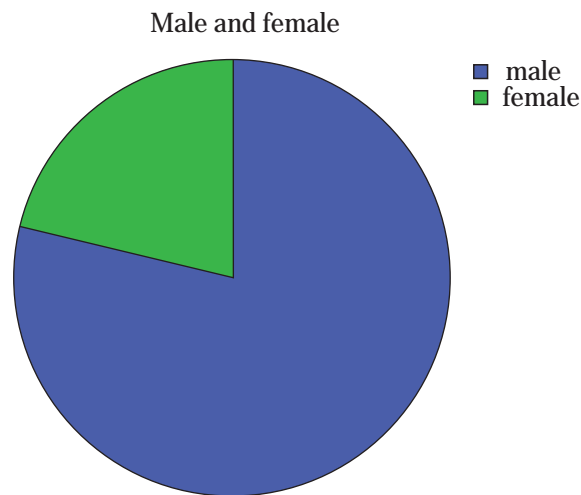


Figure 1: This pie diagram shows the distribution of study participants according to gender i.e. 21% females and 79% males.

The maximum number of respondents (68%) belonged to the age group of 25-35 years and about (51%) participants had an experience of 10-20 years (Table 1).

Period of practice	Frequency (n)	Percent (%)	Age of practitioners (years)	Frequency (n)	Percent (%)
<5	11	11	25-35	68	68
5-10	25	25	35-55	28	28
10-20	51	51	>55	04	4
>20	13	13			

Table 1: The following table shows the frequency (n) and percentage of study participants according to years of practice and age of practitioners.

Among respondents 10% were house officers 55% were general dental practitioners 15% postgraduate trainees and 15% were consultants

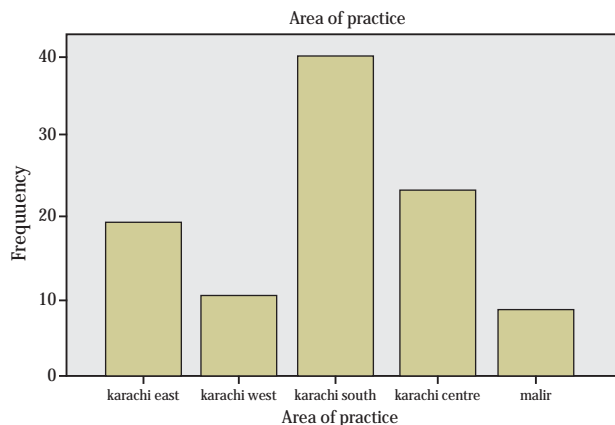


Figure 2: This bar chart shows the distribution of dental practitioners in 5 districts of Karachi

Out of 100 participants, 16% had attended professional training programs on waste management, 74% participants had not attended any continuing dental education program on dental waste management, and 10% had no idea regarding any program that offers training regarding waste management. 32% of the participants were using color-coded bins, 62% were not, and 4% were unaware.

35% participants were following segregation methods of waste disposal, 58% were not and 7% were unaware. 70% of practitioners had no dental waste management policy document, 19% claimed to have a policy document for their clinics and 11% were unaware of any such documents. 58% disposed used x-ray films into a common bin. 51% disposed x-ray lead foil in common bin and only 23% stored and disposed in a separate container. Regarding the disposal of x-ray film fixer solution, 32% emptied it directly into the sewer, 18% diluted the solution and then disposed it into the sewer, 6% returned it to the suppliers and 44% were unaware of the policy adopted by their clinic.

Waste collection storage and handling was done by dental assistants in 62% clinics, whereas in 21% of clinics, the cleaner was assigned this task and in 12% clinics dental surgeons themselves were responsible for this duty.

76% clinics disposed final dental waste directly into corporation bins, 14% handed it over to certified collectors and 10% were unaware of how the final disposal took place. 55% stored the final dental waste inside their clinics, 29% outside the clinics, 11% stored in the lab area and remaining 5% had no idea.

Knowledge				
Professional training	16 (Yes)	74 (No)	10 (Don't know)	
Disposal of infectious waste	76 (Corporate bin)	14 (Certified collector)	10 (Don't know)	
Waste management policy	19 (Yes)	70 (No)	7 (Don't know)	
Attitude				
Infectious waste collection responsibility	12 (Dentist)	62 (Assistant)	21 (Cleaner)	5 (others)
Use proper color coding	34 (Yes)	62 (No)	4 (Don't know)	
Use of Personal Protective Equipments	33 (Always)	48 (Sometimes)	18 (Never)	
Practices				
Segregation of infectious waste	35 (Yes)	58 (No)	7 (Don't know)	
Throw x-ray waste in wrong bin	58 (Common bin)	17 (Soil & Landfill)	25 (Don't know)	
Final Waste storage	55 (inside clinic)	29 (outside clinic)	11 (Lab area)	5 (Don't know)

Table 3: shows the distribution of respondents by knowledge, attitude and practice answers.

and 10% were unaware of how the final disposal took place. 55% stored the final dental waste inside their clinics, 29% outside the clinics, 11% stored in the lab area and remaining 5% had no idea.

Less than 32% of the research candidates used the segregation method. 44% were unaware of the standard methods to dispose x-ray fixer waste. In the studied centers, dental assistants mostly did handling of dental waste by improper methods.

DISCUSSION

Systematic and organized management of possibly hazardous waste is basic for the wellbeing of patients, dental practitioners and our environment.⁴ Dental clinicians and their assistants can assure proper sterilization in clinics and handle problems related to dental waste disposal if they follow set guidelines for the management of biomedical waste.^{4,7}

The entire amount of dental waste processed in a single day can be divided into the following subtypes: infectious, non-infectious and domestic.⁸

Nabizadeh R et al. reports in a study, that approximately 71.15% of dental waste consisted of domestic waste, 21.40% was infectious waste, 7.26% was chemical waste, whereas only 0.18% was toxic waste.⁹

According to a study done in Sydney, Australia, it was found that out of 14 dental clinics only 5 were following proper guidelines for the collection and disposal of infectious waste.¹⁰ Another study in New Zealand demonstrated that almost 25% of dental facilities directly threw dental sharps in common bins.¹¹

A report of a similar study carried out in Hamadan, Iran, revealed all the amalgam waste was disposed into the main sewerage line and used sharps were thrown into the common waste.⁹ Research carried out in Pakistan reports that most private practitioners disposed amalgam waste in the dustbin or simply into the sewer, only 6 out of 221 dentists, used a sealed container for storage of amalgam waste.¹²

Although, dental waste management protocol is outlined by the government, the knowledge regarding this subject is still lacking which suggests the need for continued dental education programs, and the need for continuous monitoring of the practices.^{2,12}

In most developing countries including Pakistan, management of biomedical waste disposal is becoming a major problem and if not addressed promptly it will further worsen the environmental crisis.¹³ Although guideline documents devised by the Health Department on dental waste management is available, but practitioners do not have a storage standardization policy and hardly any practitioner coordinates with pollution control boards.¹³

In this study, we found that most practitioners improperly dispose of infectious and sharp waste. 70% had no dental waste management policy document and 74% of participants did not attend any CDE programs on dental waste management.

Universally, yellow plastic bags are used for segregation of infectious waste, whereas sharps should be collected in safety containers.⁷ These are incinerated or autoclaved and

finally buried under the ground of designated dumps.⁷

The above-mentioned findings of this research reveal the voids in knowledge and application of dental practitioners in Karachi, Pakistan. Small sample size and cross sectional designs were the limitations of study. It is recommended that CDE programs on dental waste management must be planned and initiated which will increase awareness of dental undergraduates and dental personnel towards proper waste management. Waste management should be taught at all levels of dentistry especially dental personnel and dental hygienist and assistants. Further research is recommended with large sample size and longitudinal design for more better results.

CONCLUSION

Dental waste is perilous to all creatures in the environment. The dental practices of Karachi are handling this insufficiently and improperly. The government ought to take the initiative and enforce adequate monitoring for all dental practices to highlight refractory activity and impose recommended directives.

CONFLICT OF INTEREST

None declared

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