Awareness-Knowledge and Practices of Dental Waste Management among Private Practitioners.

Abhishek KN,[1] Supreetha S,[1] Varma Penumatsa N,[2] Sam G,[2] Khanapure SC,[3] Sivarajan S[4]

[1]Coorg Institute of Dental Sciences, Maggula, Virajpet-571218, Karnataka, India.

[2]Prince Sattam bin Abdul Aziz University, Al Kharj, Saudi Arabia.

[3]Maharashtra Institute of Dental Sciences and Research, Latur, India.

[4]Sri Sankara Dental College, Varkala, Kerala,India.

Corresponding Author

Abhishek KN

Department of Public Health Dentistry

Coorg Institute of Dental Sciences

Maggula, Virajpet-571218

Karnataka, India.

E-mail: dr.abhishek.kn@gmail.com

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ABSTRACT

Background

Dental wastes are materials that have been utilized in dental clinics, which are no longer wanted for use and therefore discarded. Improper disposal of these dental wastes can cause harm to the dentist, the people in immediate vicinity of the dentist.

Objective

The present study was conducted to assess the knowledge and practices regarding Dental waste management among private practitioners.

Method

The study population included 186 private practitioners in three districts of Karnataka (Coorg, Mysore, Hassan), south India. A pre-tested self-administered questionnaire was distributed to assess the knowledge and practices regarding dental waste management. Descriptive statistics was used to summarize the results. The data will be statistically analyzed using chi-square test, correlation.

Result

Out of 186 study subjects, 71(38%) were females and 115(62%) were males, Chi-square analysis showed highly significant association between qualification of the study participants and their knowledge, practice of dental waste management. A statistically significant (0.0001) correlation was found between the knowledge and practice scores.

Conclusion

There was a lacunae of knowledge regarding proper biomedical waste disposal among the participants. In order to fill this vacuum CDE (Continuing Dental Education) programs have to be conducted in pursuance to maintain health of the community.

KEY WORDS

Colour code, dental waste management, knowledge, private dental practitioners

INTRODUCTION

With advancement in the field of science and research work, the quantity of bio- hazardous waste products being produced is also increasing at an alarming rate, creating instability in the ecosystem.[1] In pursuing the aims of reducing health problems and eliminating potential risks to people's health, health care services inexorably create enormous amount of biomedical waste, which creates a high potential for infection and injury. Inadequate and inappropriate treatment of this waste may have serious public health consequences and a noteworthy brunt on environment.[2]

The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Quantity may vary depending upon the specialty of the source, health set-up, its hierarchical position and service utilization patterns.[3] Dental wastes are materials that have been utilized in dental clinics and are no longer wanted for use and are therefore discarded. Dental practices generate large amounts of cotton, plastic, latex, glass, sharps, extracted teeth and other materials much of which may be contaminated with body fluids. Chemical wastes such as lead foil, mercury from amalgam restorations, photographic chemicals like fixer and developer are also generated in dental practice, which if not safely disposed can pose a threat to the environment and public health.[1]

Hence, the present study was designed to find out the knowledge and practices of private dental practitioners in three district of Karnataka, regarding management of dental waste.

METHODS

A pre-tested, self- administered, closed ended questionnaire was designed for recording all the relevant data pertaining to general information of the study participants and knowledge and practices regarding dental waste management in private clinic.

Cluster sampling was done to recruit 186 study participants, from three district of Karnataka (Coorg, Mysore, Hassan), South India. The ethical approval for the study was obtained from the Institutional Ethical Committee of Coorg Institute of Dental Sciences, Virajpet, Karnataka, and South India. Informed consent was obtained from the all private practitioners.

A pilot study was carried out on 10% of the desired population in order to check the feasibility and relevance of the prepared questionnaire. The format was designed in the English language and with respect to few questions certain modifications were done based on the observations marked during administration of format while doing pilot study. The reliability (Cronbach' alpha) of the questionnaire was tested in a pilot study done and was found to be acceptable (0.8).

The questionnaire was divided into two parts, the first part of questionnaire consisted of questions on socio-demographic variables and second part of questionnaire consisted of questions on knowledge and practices regarding dental waste management in private clinic. The study was conducted during the 1st and 3rd week of October 2012. Questionnaires were distributed to 186 private practitioners personally and they were given sufficient time to answer the questionnaire and the questionnaire was collected back on the same day or the next day. Those who participated in the pilot study were excluded from the main study.

The data analysis was done by using the statistical software SPSS version 17. Descriptive statistics summarized the results. Statistically significance was analyzed using chi-square test. Correlation analysis was done between the variables.

RESULTS

A total of 186 subjects responded to the questionnaire. As shown in table 1, 115 (62%) participants were males and 71(38%) were females. The maximum number of respondents belonged to the age group of 28 to 33 years (29%). Respondents with undergraduate qualification were more (70%) compared to postgraduate qualification (30%). Ninety (48%) participants had an experience of 0 to 5 years.

Table 1. Distribution of study subjects according to age, gender, qualification and year of experience.

Socio demographic variables		n (%)
Age	23-28 years	24 (12.9)
	28-33 years	54 (29)
	33-38 years	40 (21.5)
	38-43 years	25(13.4)
	43-48 years	13 (7)
	48-53 years	19 (10.2)
	53 years and above	11 (6)
Gender	Male	115 (62)
	Female	71 (38)
Qualification	BDS	130 (70)
	MDS	56 (30)
Experience	0-5 years	90 (48)
	6-10 years	48 (26)
	>10 years	48 (26)

Table 2 shows that the distribution of respondents by correct knowledge and practice answer. Association between Sociodemographic variables and Knowledge, Practice scores of dental waste management is shown in table 3 and 4. It is evident from table 5, that good waste management practice was observed in those who attended CDE (Continuing Dental Education) programmes compared to those who did not attend CDE programmes and this was statistically significant (0.0001).

There was a positive correlation (0.4037) between the knowledge and practice scores. It was found to be statistically significant (0.0001).

Table 2. Distribution of respondents by correct knowledge and practice answer

SN.	Questions	N(%)
1.	Has there been any CDE Programmes conducted on Waste Management by your regional IDA branch? -Yes	110(59.1)
2.	Have you attended any CDE Programmes on dental Waste Management?-Yes	104(56)
3.	Where should the dental waste be disposed?- Certified waste carrier service	160(86)
4.	The color coding for hospital waste given by biomedical waste management in India is- Yellow, Red, White, Black	108(58)
5.	The most effective way to remove accidental spill of mercury in the clinic is,- Mercury spill kit	129(69)
6.	The excess mercury obtained during amalgam mixing can be discarded - Into the developing solution	106(57)
7.	The cotton, gauze used during extraction can be disposed in - Is burnt	108(58)
8.	Are you registered with a certified waste carrier sevice to recycle or dispose the biomedical waste in your clinic?-Yes	126(68)
9.	Which color coding bag do you use to dispose syringes, needles, scalpels?-White	94(50.5)
10.	How do you dispose health care waste in your clinic? - Handling it over to biomedical waste management agency	126(68)
11.	Do you use puncture proof containers to discard needles in your clinic?-Yes	138(74)
12.	Do you segregate the waste before disposal?-Yes	131(70.5)
13.	Do you use color coded bins for disposal of waste in your dental operatory?-Yes	126(68)
14.	Which are the most common problems in management of health care waste in your clinic? - Lack of information and non availability of agency service	49(26.5)
15.	Do you think you need more knowledge regarding dental waste management?-Yes	155(83)

Table 3. Association between Socio demographic variables and knowledge scores of dental waste management.

Socio demographic variables		Knowledge scores: Very poor	Poor	Average	Good	Total	X^2-value	P-value
Age group	23-28 years	2	4	4	14	24	20.49	0.306
	28-33 years	7	8	10	29	54		
	33-38 years	5	7	9	19	40		
	38-43 years	1	2	9	13	25		
	43-48 years	1	2	5	5	13		
	48-53 years	3	4	3	9	19		
	>53 years	5	2	1	3	11		
	Total	24	29	41	92	186		
Gender	Male	17	20	25	53	115	2.15	0.540
	Female	7	9	16	39	71		
	Total	24	29	41	92	186		
Qualification	BDS	23	26	29	52	130	20.88	0.0001*
	MDS	1	3	12	40	56		
	Total	24	29	41	92	186		
Experience	0-5 years	9	13	15	53	90	8.21	0.223
	6-10 years	6	8	15	19	48		
	>10 years	9	8	11	20	48		
	Total	24	29	41	92	186		

*Significant

Table 4. Association between Socio demographic variables and Practice scores of dental waste management.

Socio demographic variables		Practice scores: Very poor	Poor	Average	Good	Total	X^2-value	P-value
Age group (Years)	23-28	5	3	8	8	24	41.76	0.001*
	28-33	11	8	20	15	54		
	33-38	1	2	11	26	40		
	38-43	1	2	8	14	25		
	43-48	1	3	2	7	13		
	48-53	2	1	3	13	19		
	>53	6	1	2	2	11		
	Total	27	20	54	85	186		
Gender	Male	20	12	35	48	115	2.98	0.394
	Female	7	8	19	37	71		
	Total	27	20	54	85	186		
Qualification	BDS	26	17	45	42	130	32.69	0.0001*
	MDS	1	3	9	43	56		
	Total	27	20	54	85	186		
Experience	0-5 years	14	11	32	33	90	17.16	0.009*
	6-10 years	3	6	17	22	48		
	>10 years	10	3	5	30	48		
	Total	27	20	54	85	186		

*Significant

DISCUSSION

Environmental pollution has become a major concern for the future of life on our planet. Biomedical waste, especially in hospitals, contributes significantly to this pollution and poses numerous potential health and safety hazards to various categories of workers.[4]

Dentists have an ethical responsibility to the environment. Even though the policy is given, there is need to establish

Table 5. Association between CDE (Continuing Dental education) programme and knowledge. Practice scores of dental waste management.

		Knowledge scores				Total	X^2-value	P-value
		Very poor	Poor	Average	Good			
CDE	Attended	10	19	21	54	104	3.72	0.294
	Not attended	14	10	20	38	82		
	Total	24	29	41	92	186		
		Practice scores						
CDE	Attended	7	11	22	64	104	27.85	0.0001*
	Not attended	20	9	32	21	82		
	Total	27	20	54	85	186		

*Significant

appropriate means of dental waste disposal in dental clinics.[5] This could be due to lack of initiative by the dental practitioners on acquiring new knowledge after training or lack of proper training at the dental school. At the same time there is lack of monitoring on waste disposal, which lead to the practitioners being reluctant to learn more.[6] So the present study was conducted to assess the Awareness, Knowledge and Practices of Dental Waste Management among dental Practitioners.

Out of 186 subjects, 56% of the participants have attended CDE programme which was conducted by regional IDA branch. There was a statistically significant (<0.05) association between CDE programme and practice scores of dental waste management. This may be attributed to the updated information provided in these programmes.

Sixty nine percent of the participants were aware about the mercury spill kit being the most effective way to remove accidental spill of mercury in the clinic. Fifty seven percent of the participants replied that they are discarding excess mercury obtained during amalgam mixing into the developing solution. This is similar to another study conducted at dental clinics in northern Sweden in which 36% of dentists were segregating excess mercury and amalgam.[1] Disposal of excess mercury without proper precautions is a burden to the environment.[7]

In the current study, only 58% of respondents incinerated the bloody waste, while 15.5% disposed bloody waste into the dust bin. Inspite of great emphasis placed on sterilization and dental waste management in the UG and PG curriculum, the present showed definite lack of proper practices regarding these aspects of dentistry. However, the method of disposal of bloody swabs was better in present study participants when compared to the dentists in New Zealand wherein 56.4% replied of disposing bloody swabs in general waste. The social desirability drawback of a questionnaire study cannot be excluded in the present study. The results are to be interpreted with caution.

Only 68% of the participants have registered with a certified waste carrier service to recycle or dispose the biomedical waste in their clinic. And only about 68% of the participants were handling it over dental waste to biomedical waste management agency. Within India there have been no prosecutions of dentists for illegal disposal of clinical waste and it would appear that the fear of prosecution is insufficient to alter behavior.[7]

Sixty eight percent of the participants were using color coded bins for disposal of waste in their dental operatory. More than half (50.5) of the participants were using white color coding bag to dispose syringes, needles, scalpels. And 74% of the participants were using puncture proof containers to discard needles in their clinic.

This study showed that a substantial percentage of practitioners (29.5%) dispose dental waste without segregation and prior disinfection which exposes garbage collectors to a high risk of getting infected from health care waste. In a similar study done in New Zealand, only 24.4% subjects disposed of contaminated waste sharps items into general household refuse collection.[8] Twenty eight percent of the participants replied that the safe management of health care waste was an extra burden to the private practitioners, which showed their poor and inadvertent attitude towards this aspect of practice.[7]

The present study showed, there was a statistically significant association between knowledge and practice among BDS qualified and MDS qualified dentists. This is in contrast to the finding of other Studies, showed that there was no significant difference between the graduate and post-graduate groups regarding proper practice of BMW management (35-45%) indicating that the knowledge is limited mostly to theoretical aspect, in need of practical implementation.[3]

In the present study 83% of the participants thought that they need more knowledge regarding dental waste management and 26.5% of the participants felt that Lack of information and non availability of agency service are the most common problems in management of health care waste in their clinic. Specialized waste carrier services are available in most localities however; there is a need for dentists to receive specific information about availability of services.[8]

CONCLUSION

Dentists need education regarding health care waste disposal methods to improve their knowledge. A large proportion of the dentists are not practicing proper methods of health care waste disposal. The existence of legislation governing health care waste disposal is not sufficient alone to motivate many practitioners to comply with guidelines. At the same time number of biomedical waste management services need to be started at an economically feasible rate,

so that majority of the practitioners would willingly agree to contact the services. Widespread publicity of a few cases of inappropriate health care waste management services might help to raise public and professional awareness of the possible consequences of improper procedures.

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