



KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS ECO-FRIENDLY DENTISTRY AMONG DENTAL PRACTITIONERS

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ABSTRACT

Aim: The survey aims to assess the knowledge, attitude and practices regarding eco -friendly dentistry among dental practitioners.

Material and Methods: The cross sectional study was conducted among 800 dental practitioners selected through a systematic random sampling. Data was collected using the pretested structured closed ended questionnaire. The first part of the questionnaire consisted of the demographic details and the second part awareness on eco-friendly dentistry, its associations and implemented strategies in their practice, their support and opinion towards this concept.

Results: Among the total sample only 13.1% were aware of EFD Association. 76% (608) of the total sample reported that they were aware of harm done to the environment by dental practice. Among the total participants, majority 57.9% reported that they implement the strategy of proper protocol for waste disposal. Among the total sample 91.9% (735) of them gave positive opinion on emphasis to be made on implementing these strategies.

Conclusions: Significant difference was found in gender, specialty, place of practice and type of practice related with knowledge attitude and practice on eco friendly dentistry. Significant difference was found in study subjects related with awareness on eco friendly dentistry concept, following the concept, awareness on the harm done by dental practice, opinion on emphasis to be made on implementing these strategies.

KEYWORDS: eco-friendly dentistry, KAP, environment, innovative dentistry

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INTRODUCTION

One of the greatest problems that the world is facing today is that of

environmental pollution, increasing with every passing year and causing grave and irreparable damage to the earth¹. Dental practice accumulated waste has

significant impact. The most common waste products in dental practices are found to be amalgam restorative materials, radiographic chemicals,

plastic/paper barriers and disinfectant solutions^{2,3}. Dentists contribute between 3% and 70% of the total mercury load entering wastewater treatment facilities. Estimated 680 million plastic and paper chair barriers and 1.7 billion instrument and sterilization pouches are dumped into landfills yearly^{4,5}.

Eco-Friendly Dentistry is a newly evolving practice of dentistry, which encompasses a simultaneous devotion to sustainability, prevention, precaution, and a minimally invasive patient-centric as well as global-centric treatment philosophy. The responsibility of a dentist is not just towards the patient but towards preservation of environment also. There has been negligence by dental practitioners in waste disposal from the very beginning of dentistry. Eco-Friendly Dentistry, through green design and operations, protects the immediate health of patients and team members, the health of the surrounding community, and the health of the global community. The implementation of eco-friendly practices in the dental office involves an extensive list of protocols, procedures, materials, state-of-the-art equipment and methods, but does not have to be a daunting endeavour and can be accomplished with small, incremental steps and natural resources. Going green can also mean saving green, as in dollars⁶.

It is sustainable approach to encourage dentists to implement new strategies to try and reduce the energy being consumed and the large amount of waste being produced by the industry. It is Healing our planet by Four R's i.e. Rethink, Reduce, Reuse, Recycle². Studies have shown that Digital imaging systems provide time efficiencies, as well as reduce nearly 28 million tons of toxic X-ray fixer and 4.8 million lead foils dental practices dump annually into the

environment⁵. A long term financial analysis has to be done to ascertain the economic advantages to eco friendly dental practices. Certainly there are significant upfront and ongoing costs for doing Eco friendly dentistry⁷. Therefore the present study was done to assess the knowledge, attitude, practice regarding eco -friendly dentistry among dental practitioners in twin cities Hyderabad and Secunderabad, Telangana, India.

MATERIAL AND METHODS

A cross-sectional survey was conducted among the dental practitioners working in private dental practices of the twin cities of Hyderabad and Secunderabad, Telangana, India. Only private practitioners were chosen as they directly control their dental offices and procedures, unlike government/public sector dentists. The list of dental clinics was obtained from the office of the Indian Dental Association, Deccan branch. Systematic random sampling was used and. Ethical Clearance was obtained from the Ethical Committee of Army College of Dental Sciences, Jawahar Nagar, Secunderabad. Voluntary informed consent was obtained from dental practitioners after explaining the purpose of the study and the assurance of maintenance of anonymity. The self designed questionnaire was pilot tested among 75 volunteer dentists to derive the sample size and also to check the reliability and internal consistency of the questionnaire. A sample size of 800 was considered adequate. Data was collected using the pretested structured closed ended questionnaire. The first part of the questionnaire consisted of the demographic details and the second part awareness on eco-friendly dentistry, its associations and implemented strategies in their practice, their support and

opinion towards this concept. SPSS package version 7.0 was used for statistical analysis of the questionnaire data. Chi-square test was used to understand the proportions.

RESULTS

The demographic data of the participants has been presented in table 1. Among the total sample only 13.1% were aware of EFD Association. 76% (608) of the total sample reported that they were aware of harm done to the environment by dental practice. In relation to the awareness on kind of harm done to the environment, majority 58.7% (399) of the total participants reported as all the above i.e. by amalgam restorative materials, radiographic chemicals, plastic/paper barriers, disinfectant solutions (Figure 1). 0.5% (4) of them specified other kinds of harm done to the environment as sound pollution and unorganized waste disposal.

Among the total participants, 95% (759) of them reported they felt responsible not to harm environment. 96.7% (773) of them reported that they tried to reduce the harm done to the environment.

Among the total participants, majority 57.9% reported that they implement the strategy of proper protocol for waste disposal. 56.3% used alternative restorative materials instead of amalgam and 0.55 of them reported all the above i.e., use of renewable sources of energy like solar energy, keeping records of material usage and wastage, Following the protocol for proper waste disposal, Implementing the protocol of waste segregation, provisions for recycle of materials, encourage the concept of recycle, Incorporation of plants, Digital mode of data storage (paperless dentistry), Recycling fixer, developer and

lead foil, using biodegradable house tip, usage of less harmful surface materials instead of amalgam (Figure 2).
 keeping materials, using dry dental disinfectant, using of amalgam
 vacuum pump or stainless steel suction seperatores, using alternative restorative

Table 1. Demographic data and knowledge regarding eco-friendly practices.

S.No.	Variable	No. of Practioners	Percentage	Significant test and P value
1	Gender			
	Male	417	52.2%	$\chi^2=56.96$; $p<0.05$
Female	383	47.8%		
2	Place of practice			
	Hyderabad	420	52.4%	$\chi^2=5.32$; $p<0.05$
Secunderabad	380	47.6%		
3	Qualification			
	Conservative dentistry	63	7.9%	$\chi^2=799.0$; $p<0.05$
	Oral medicine	37	4.6%	
	Oral maxillofacial surgery	31	3.9%	
	Oral pathology	28	3.5%	
	Orthodontia	60	7.5%	
	Pedodontia	38	4.8%	
	Periodontia	68	8.5%	
Public health dentistry	24	3.0%		
Prosthodontia	49	6.1%		
4	Type of practice			
	Single handed private practice	446	55.8%	$\chi^2=18.36$; $p<0.05$
	Group practice	94	11.8%	
	Multispeciality	228	28.5%	
Dental wing in general hospital	32	3.9%		
5	Aware of ecofriendly dentistry (EFD) concept			
	Yes	324	40.6%	$\chi^2=4.43$; $p<0.05$
No	476	59.4%		
6	Follows EFD concept			
	Yes	97	29.9%	$\chi^2=21.56$; $p<0.05$
	No	52	16%	
Follow few strategies	175	54%		
7	Aware of EFD association (EDA)			
	Yes	106	13.1%	$\chi^2=0.021$; $p<0.05$
No	694	86.9%		
8	Aware of harm done to environment by dental practice			
	Yes	608	76%	$\chi^2=5.6$; $p<0.05$
No	192	24%		
9	Felt responsible not to harm environment			
	Yes	759	95%	$\chi^2=0.9$; $p>0.05$
No	40	5%		
10	Tried to reduce the harm done to the environment			
	Yes	773	96.7%	$\chi^2=0.66$; $p>0.05$
No	26	3.3%		
11	Opinion on emphasis to be made on implementing these strategies			
	Yes	735	91.9%	$\chi^2=6.2$; $p<0.05$
No	45	5.6%		

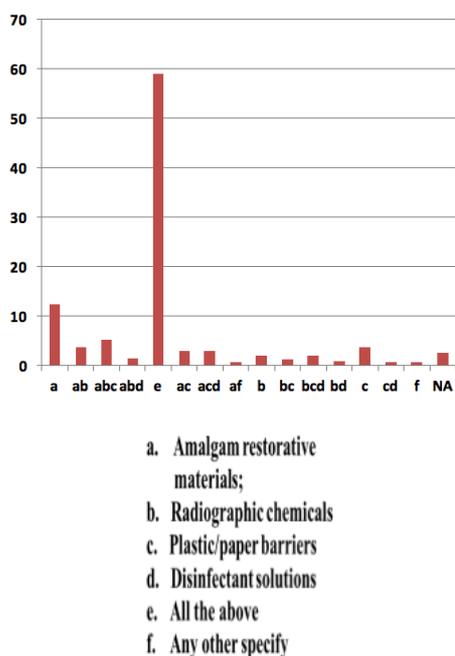
Among the total sample 91.9% (735) of them gave positive opinion on emphasis to be made on implementing

DISCUSSION

In the present study >50% were

not aware of eco friendly dentistry concept. On the contrary in a study conducted by Shatrat et al³; >50% were aware of eco friendly dentistry concept. In the present study, 7.8% were using solar energy, 34% were using Digital mode of storage and 20% were having provision for recycle of materials where as in the study conducted by Shatrat et al³ 8% were using solar energy, 79% were using Digital mode of storage, 18.8% were having Provision for recycle of materials. In a study conducted by Abdulla et al⁸ 2% were using solar energy.

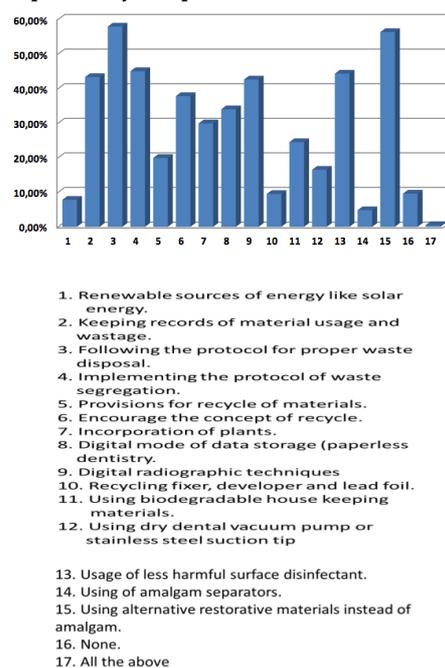
Figure 1. Eco-friendly practices as reported by the study subjects.



In the present study, 60% follow the protocol for proper waste disposal and 45% implement protocol of waste segregation. Where as in a study conducted by Neto et al⁹ 90.9% carried waste segregation, 54.5% did not follow protocol for waste disposal which might be due to "No separate collection for health service solid waste in Brazil". In the present study only 9.5% followed proper waste disposal and recycling methods for radiographic waste and nearly 45% were implementing digital

radiography. Near similarity was found in a study conducted by Shatrat et al³ in which approximately 30% followed proper waste disposal and recycling methods for radiographic waste which was found to be very low implementation and 72% implemented digital radiography which was found to be very high implementation.

Figure 2. Eco-friendly strategies as reported by the practitioners.



In the present study 24.5% were using biodegradable house keeping materials, 16.5% were using reusable stainless steel/ dry vacuum pump where as in a study conducted by Shatrat et al³ 40% were using biodegradable house keeping materials, 15.4% were using reusable stainless steel/ dry vacuum pump. It is proved in a study conducted by Gregg et al¹⁰ that Dry vacuum pump saves water and electricity. In the present study 4.8% used Amalgam separators. Similarly in a study conducted by Iqbal¹¹ in Pakistan, only 5% used amalgam separators. In the present study nearly 60% were using alternative restorative material instead of Amalgam.

Similarly in a study conducted by Ylinen et al¹² in Finland and Sweden amalgams use has almost ceased, particularly for the younger age group where as in Contrary in Denmark it is still in use^{13,14}.

CONCLUSIONS

Significant difference was found in gender, specialty, place of practice and type of practice related with knowledge attitude and practice on eco friendly dentistry. Significant difference was found in study subjects related with awareness on eco friendly dentistry concept, following the concept, awareness on the harm done by dental practice, opinion on emphasis to be made on implementing these strategies.

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