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Knowledge, Attitude and Practice towards Eco-Friendly Dentistry among Dental Practitioners in North Bangalore

Zaharunnissa, R. Murali, Shamala A, Mansi Yalamalli, Punith Shetty, S Divya
Department of Public Health Dentistry, Krishnadevaraya College of Dental Sciences, Hunsamaranhalli, International Airport Road, Bangalore - 562157, India.

Address for Correspondence:
Dr. Zaharunnissa, Post Graduate, Department of Public Health Dentistry, Krishnadevaraya College of Dental Sciences, Hunsamaranhalli, International Airport Road, Bangalore - 562157, India.

ABSTRACT:

Eco-friendly dentistry is an approach to dentistry that implements bearable practices by keeping resource consumption in line with nature's economy, by safeguarding the external environment by virtue of eliminating or reducing outgoing wastes and by stimulating the well-being of all those in the clinical environment by conscious reduction of the chemicals in the breathable air.The present study was conducted to assess the dental practitioner's knowledge, attitude and practice regarding eco-friendly dentistry.

Methods: The pre-tested, structured, closed ended questionnaire was self-administered to 150 dental practitioners of North Bangalore, to collect responses on knowledge, attitude and practices towards eco-friendly dentistry. The questionnaire comprised of 22 questions including gender, qualification and years of dental practice.The data obtained was analyzed using MINITAB version 17 and $P < 0.05$ was considered statistically significant. Chi square test was used to analyze the data.

Results: Among the 150 dental practitioners in the study, 63% were BDS graduates and 37% were practitioners with post-graduation (MDS). Dental practitioners with post-graduation (MDS) were more knowledgeable as compared to BDS graduates. Knowledge and practice level of eco-friendly dentistry among dental practitioners indicated that 62% and 38% had moderate and adequate knowledge and practice level respectively. Attitude towards eco-friendly practice of dentistry among dental practitioners showed that 56.7% and 43.3% had moderate and adequate attitude scores respectively.

Conclusion: Overall knowledge, attitude and practice of eco-friendly dentistry among dental practitioners was adequate among dental practitioners of Bangalore North.

Keywords: Dental practitioners, Eco-friendly dentistry, KAP (Knowledge, Attitude and Practice).

INTRODUCTION

Dentistry is a profession committed to promote and enhance oral health and well-being. To achieve these goals, dentists use a variety of provisions and equipment. Unfortunately, some of the provisions that are currently in use – including heavy metals and biomedical waste – present potential challenges to the environment.[1] To counter the ill-effects towards environment, more recently, the term "Eco-Dentistry or Green Dentistry" has been established which has taken dentistry beyond the point of preventing pollution to a place of promoting sustainability.[2] Eco-friendly dentistry is an approach to dentistry that implements bearable practices by keeping resource consumption in line with nature's economy, by safeguarding the external environment by virtue of eliminating or reducing outgoing wastes and by stimulating the well-being of all those in the clinical environment by conscious reduction of the chemicals in the breathable air.[3]

It integrates ecologically sustainable materials and practices that reduce the impact of medical procedures on the environment as well as protecting consumers from toxic materials.[3]

In India, health care professionals have failed to assure safe and quality disposal of waste created while imparting health care to people. The concern of the public which is rightly emphasized by the media led to the legislating of biomedical waste [management & handling] rules 1998 by the Ministry of Environment and

Forests, Govt. of India.It is important to have consistent information about procedures followed currently by private dental practitioners in order to determine whether dentists and their staff are able to comply with the propagated guidelines.[4]

Hence, understanding dentists' perceptions of their practices, the information and education can be directed appropriately. Accordingly, a survey was conducted to assess the dental practitioner's knowledge, attitude and practice regarding eco-friendly dentistry. Thus the aim of the present study was to determine the knowledge, attitude and practices towards eco-friendly dentistry among dental practitioners of Bangalore North using a questionnaire.

METHODS

Study design: The present study was a questionnaire based, descriptive, cross sectional study.

Study setting: The study was conducted among dental practitionersof Bangalore North.

Selection of participants :The dental practitioners' list was obtained from Karnataka State Dental Directory, who were registered in Karnataka State Dental Council. Convenience sampling technique was used in the present study. All the dental practitioners who agreed to participate in the survey were included in the study. Informed consent was obtained from the dental practitioners before the start of the study.

Data collection: The study involved self-administration of a pre-tested structured closed ended questionnaire to the dental practitioners. Questionnaire consisted of 22 questions. The first section included demographic data such as gender, qualification and years of dental practice. The second section consisted of 13 questions to evaluate knowledge and practice regarding eco-friendly dentistry. In the third section, attitude was assessed by 5 questions which included the information regarding the dentists' attitude towards the eco-friendly practices. The data was collected during the working hours of the dental clinics. The dental practitioners were asked to fill the questionnaire and an average time of 15 minutes was taken to complete questionnaire. Anonymity of the respondents was assured. The study was conducted for a period of four months from October 2014 to January 2015. A pilot study was conducted among 30 dental practitioners for pre-testing the questionnaire and to determine feasibility of the study. Cronbach's Alpha calculated for the questionnaire was 0.73.

Ethical approval and Statistical analysis:

The ethical clearance was obtained from Institutional Review Board of Krishnadevaraya College of Dental Sciences.

The data collected was compiled using Microsoft excel sheet and was subjected to statistical analysis using MINITAB version 17 for MS Windows and $P < 0.05$ was considered statistically significant. Frequency distribution, number, percentage was calculated. The descriptive statistics and statistical significance of any difference was determined using Chi square test.

RESULTS

A cross sectional study was conducted among 150 Dental practitioners. It was seen that 56% were males and 44% were females. (Figure 1) Qualification-wise distribution showed that 63% were BDS dental practitioners and 37% were MDS dental practitioners (Figure 2). The responses to knowledge,attitude and practice components towards eco-friendly practices of the KAP questionnaire were categorized into three for the determination of analysis based on the scores obtained i.e. inadequate (< or = 50% score), moderate (51-75% score) and adequate (> or = 75% score). It was seen that 62% had the moderate knowledge and practice levels and the attitude levels was 56.7%. Among the dental practitioners, 38% had adequate knowledge and practice levels and the attitude level was 43.3% (Table 1).

The comparison of demographic variables related to knowledge and practice among dental practitioners was assessed, where it was seen that 59.4% dentists in the age group of 40 and above had adequate knowledge and

practice level as compared to the age groups 30-39 (33.3%) and 21-29 (30.8%),whereas it was seen that the age group of 21-29(55.8%) years had adequate attitude score as compared to the age group 30-39 (40.9%) and aged more than 40 (28.1%) and the difference was statistically significant.

Gender-wise distribution showed that 45.2% of females had an adequate level of knowledge and practice than males (28.8%). Among attitude scores, males had a higher percentage when compared to females this difference was statistically significant.

Qualification-wise distribution showed that the dental practitioners with post-graduation (MDS) were more knowledgeable as compared to BDS graduates. Duration of dental practice did not show any statistical significance in knowledge, practice and attitude scores (Table 2). The distribution of eco – friendly strategies being followed among the dental practitioners was assessed.To determine the knowledge attitude and practice of dentists regarding eco-friendly strategies, the responses available was: 'Fully in Place', 'In Progress' and 'Aware of Strategy–But not Implemented'. Responses of 50% or higher for 'Fully in Place' and 'In Progress' indicated a high level eco-friendly management strategies among the respondents. It was observed that 67.9% of the study population utilised paper cups in their practice. 71.3% of the dental practitioners practiced computer based record systems. 72% of the study population used educational videos to explain dental procedures. 99% used laundered cloth hand towels rather than paper wipes. 56.6% of dentists implemented recycling of dental office paper waste. 73.4% dentist of the total study population used digital radiography. 80.6% dentist used cloth lab coats rather than disposable ones and also 94.7% dentist implemented theuse of sterilisable instruments, trays, and film holding devices rather than disposable products. 80% dental practitioners of the study population had compact fluorescent light bulbs in their clinics.51.4%dentists had water faucet sensors in their clinics. 96.7% dentists used hand sanitizer. 88% dentists purchased chemicals in concentrated form and prepared chemicals as needed to eliminate excess and also 74% of them followed disposal of lead foils as separate waste for recycling. 43.3% dentists of the study population had amalgamator in dental practice. 57.4% dentists kept unused amalgam particles in closed containers. 36.6% dentist had amalgam separators. 89.3% used alternatives to amalgam filling such as composite, ceramic.

DISCUSSION

Dental offices generate a significant amount of waste on a regular basis. Eco-friendly dental offices utilise strategies that minimise toxic waste generated and help reduce the negative impact of global warming. By adopting these strategies, there is decreased harm to overall human health and the environment.[5] Literature has revealed a paucity of research related to aspects of eco-friendly dentistry among dental practitioners. Thus, the present study was conducted with the aim of determining the knowledge, attitude and practice towards eco-friendly dentistry among dental practitioners in North Bangalore.

The present study showed that 62% of dentists had the moderate knowledge and practice level and 38% had adequate knowledge and practice level towards eco –friendly practice (Table 1). It was observed that 56.7% of dentists had moderate attitude and 43.3% had an adequate attitude towards eco-friendly practice (Table 1).

In the present study, the association between demographic variables like age gender, qualification (BDS and MDS) and duration of practice with knowledge and practice level on Eco-friendly Dental Practice level showed that there was statistically significant difference exists with respect to age, gender qualification. However, duration of practice had no significant difference (Table 2). Similarly, the association between demographic variables and attitude level on Eco-friendly Dental Practice level was observed. The variables like

Table 1: Percentage Distribution of Dental Practitioners according to Knowledge, Practice and attitude level of Eco-Friendly Practices

	Inadequate(%)	Moderate(%)	Adequate(%)
Knowledge and practice level	0	62	38
Attitude level	0	56.7	43.3

Table 2: Association between Demographic Variables and Knowledge practice and attitude level on Eco-friendly Dental Practice level.

Demographic Variables	Category	Sample	Knowledge & Practice Level		Attitude		χ^2 Value	P Value
			Moderate	Adequate	Moderate	Adequate		
			N (%)	N (%)	N (%)	N (%)		
Age group (years)	21-29	52	36 (69.2)	16 (30.8)	23 (44.2)	29 (55.8)	7.97	P<0.03*
	30-39	66	44 (66.7)	22 (33.3)	39 (59.1)	27 (40.9)		
	>40	32	13 (40.6)	19 (59.4)	23 (71.9)	9 (28.1)		
Gender	Male	66	47 (71.2)	19 (28.8)	31 (47.0)	35 (53.0)	4.25	P<0.03*
	Female	84	46 (54.8)	38 (45.2)	54 (64.3)	30 (35.7)		
Qualification	BDS	94	64 (68.1)	30 (31.9)	47 (50)	47 (50)	3.96	P<0.04*
	MDS	56	29 (81.8)	27 (48.2)	38 (67.9)	19 (32.1)		
Duration of practice (years)	0-5	78	46 (59)	32 (41.0)	46 (59)	32 (41)	6.18 NS	P>0.19
	5-10	29	16 (55.2)	13 (44.8)	18 (62.1)	11 (37.6)		
	10-15	28	23 (82.1)	7 (46.7)	12 (42.9)	16 (57.1)		
	>15	15	8 (53.3)	7 (46.7)	9 (60)	6 (40)		
Combined		150						

* Significant at 5% Level, NS: Non-significant

Figure 1: Gender-wise distribution of Dental Practitioners

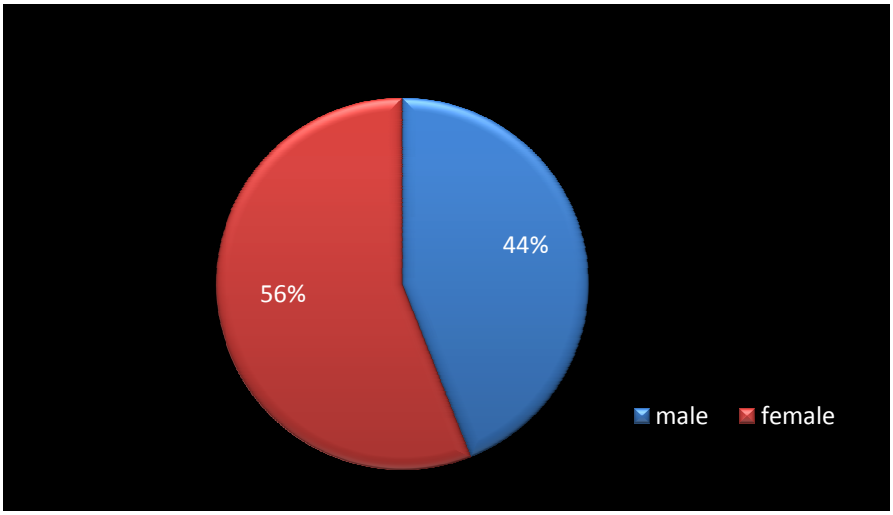

Figure 2: Qualification-wise distribution of Dental Practitioners

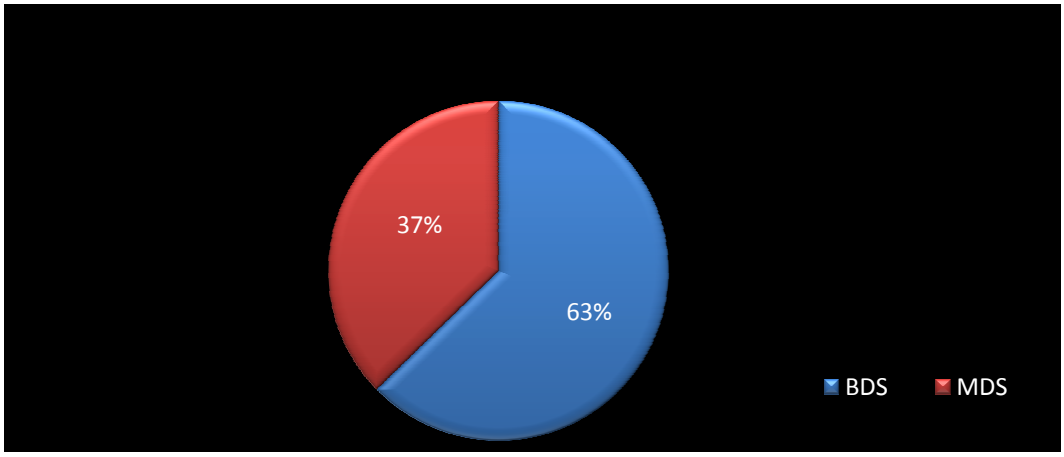

Table 3: Percentage Distribution of Eco-friendly Strategies among Dental Practitioners

Sl. No.	Strategies	Fully in Place n (%)	In Progress n (%)	Total implement-ation n(%)	Aware, not implemented n (%)
1	Use of paper cups	52 (34.7)	48 (32)	100(67.9)	47 (31.3)
2	Computer based record systems	40 (26.6)	67(44.7)	107(71.3)	43(28.7)
3	Educational videos to explain dental procedures	50(33.3)	58(38.7)	108(72)	41(27.3)
4	Laundered cloth hand towels rather than paper wipes	67(44.7)	32(21.3)	99(66)	47(31.3)
5	Recycling of dental office paper waste	53(35.3)	32(21.3)	86(56.6)	52(34.7)
6	Digital radiography	55(36.7)	55(36.7)	110(73.4)	39(26)
7	Cloth lab coats rather than disposable ones	77(51.3)	44(29.3)	121(80.6)	29(19.3)
8	Sterilisable instruments, trays, and film holding devices rather than disposable products	111(74)	31(20.7)	142(94.7)	8(5.3)
9	Compact fluorescent light bulbs	81(54)	39(26)	120(80)	27(18)
10	Turn off and unplug all the electrical appliances at the end of the day	121(80.7)	19(12.7)	140(93.4)	7(4.7)
11	Water faucet sensors	43(28.7)	34(22.7)	77(51.4)	63(42)
12	Hand sanitizer	127(84.7)	18(12)	145(96.7)	3(2)
13	Purchasing of chemicals in concentrated form and preparing chemicals as needed to eliminate excess	102(68)	30(20)	132(88)	15(10)
14	Disposal lead foils as separate waste for recycling	67(44.7)	44(29.3)	111(74)	36(24)
15	Amalgamator in dental practice	48(32)	17(11.3)	65(43.3)	83(55.3)
16	Keeping of unused amalgam particles in closed containers	52(34.7)	34(22.7)	86(57.4)	62(41.3)
17	Amalgam separators	32(21.3)	23(15.3)	55(36.6)	79(52.7)
18	Use of alternatives to amalgam filling such as composite, ceramic	83(55.3)	51(34)	134(89.3)	16(10.7)

age, gender and qualification exhibited statistically significant difference with the eco-friendly practice level (Table 2).

In the present study, the majority of the dentists had a high level of knowledge and practice about the use of paper cups rather than plastic disposable cups. Our study revealed that most of the dentists (71.3%) used computer based recording systems and therefore might not be frequently using paper pads. This explains that the use of paper was low among the practitioners (Table 3). This

finding was in accordance with the study conducted by Sabha M et al[5] (78.7%). 72% of the dentists used educational videos to explain different dental procedures to patients. This finding was in contrast with the study conducted by Sabha M et al[5] (20%). This may be due to the technology and the location of the study population. The practitioners had a high level of knowledge regarding recycling of paper waste but only 56.6% of them implemented. This was in contrast with the study by Sabha M et al[5] (8%).

In the present study, although there was a high level of awareness regarding the use of laundered cloth hand towels rather than paper wipes the overall implementation was low (66%). No literature was available for comparison with respect to this aspect. In the present study, it was revealed that majority of dental practitioners (94.7%) practiced use of sterilisable instruments, trays, and film holding devices rather than disposable products. This finding was in contrast with the study conducted by Sabha M et al[5] (54%)

In the present study, it was observed that the dental practitioners had a high level of knowledge, practice and attitude towards electricity management. 80% of them used Compact Fluorescent Light bulbs and 93.4% turned off and unplug all the electrical appliances at the end of the day. These findings were in accordance with the study by Sabha M et al[5] where 94% of them used Compact Fluorescent Light bulbs and 75.4% of them turned off and unplug all the electrical appliances when not in use.

The results of our study revealed a high use of sanitiser (96.7%) and therefore represented a low need for water faucet sensors (51.4%). This finding was in accordance with the study conducted Sabha M et al[5]. In the present study, it was observed that majority of the practitioners had a high level of knowledge about the strategies regarding radiographic waste management. 88% of them purchased chemicals in concentrated form and prepared chemicals as needed to eliminate excess. This finding was in contrast with the study by Sabha M et al[5] (62.6%). In the present study, it was found that 74% of them disposed lead foils waste separately for recycling. This was in contrast with the study by Sabha M et al[5] (13.3%). In the present study, it was observed that 73.4% dental practitioners used digital radiography. This finding was in accordance with the study conducted by Sabha M et al[5] (72%). The reason may be that the dental digital images are computerised and stored electronically instead of a paper chart. In the present study, it was found that only 43.3% of dentists had amalgamator in use in their practice. 57.4% of them practiced keeping unused amalgam in the closed container. This finding was in contrast with the study by Sabha M et al[5] (36%). In the present study, it was found that only 36.6% used amalgam separators. This was in accordance with the study by Sabha M et al[5] (25.3%). This low level of implementation of amalgam management strategies could be due to high use of alternative restorative materials (89.3%). This was in corroboration with the study by Sabha M et al[5] 92% of the dentists used alternative restorative materials.

Certain limitations must be considered when interpreting the results. The questionnaire was limited to few strategies of eco-friendly practice in dentistry in order to increase compliance and hence could not cover all aspects. Literature is limited concerning eco-friendly approaches in the dental office and thus limits substantiation of the results.

A continued focus on the impact of dental practices on the environment is needed through formal and continuing dental education. Encouragement of implementation of ecofriendly strategies is needed.

CONCLUSION

Overall knowledge, attitude and practice of eco-friendly dentistry among dental practitioners was adequate among dental practitioners of Bangalore North. Eco-friendly dentistry reduces wastage and prevents pollution and oral health professionals play an important role in protecting the environment.

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