

Dental Perspective on Biomedical Waste and Management, a Knowledge, Attitude and Practice Survey: A Cross-sectional Study

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ABSTRACT

Background: The biomedical waste is known as the second dangerous waste in the world that needs to be properly managed. Since the implementation of the Biomedical Waste Management Rules 1998, every concerned health personnel is expected to have proper knowledge, practice, and capacity to guide others for waste collection and management, and proper handling techniques. **Objective:** This study was planned to evaluate the practical calibration and awareness of dental surgeons in the disposal of hazardous biomedical waste generated during dental treatment into color-coded disposing bags at a dental clinic. **Materials and Methods:** A cross-sectional, a pretested, semi-structured, and questionnaire-based survey contain 53 questions to assess the knowledge, attitude, and practice on biomedical waste management among dental surgeons. Results were expressed as a number and percentage of respondents for each question, and Chi-square test was performed for inferential statistical analysis with $P = 0.05$ indicating level of significance. **Results:** Results show that a large percentage of the dentist was not aware of the process of biomedical waste management (89%), whereas about half of the subjects were moderate to slightly aware about the recycling/reusing of dental materials. **Conclusion:** The study revealed that knowledge, attitude, and practice regarding biomedical waste management were low. Periodical sensitization and training program should be conducted for health care providers.

Key words: Attitude, Knowledge, biomedical waste, dental health care personnel, self-administered questionnaire, waste management

INTRODUCTION

The essences of cleanliness were captured by the Dravidians, who in 5000 B.C gave due emphasis to safe and effective sewerage systems, to get rid of all solid and liquid waste generated by the population. They were indeed the pioneers as far as scientific waste management is considered.^[1]

World Health Organization (WHO) defines health-care waste as total waste generated by Hospitals, health-care

establishments, and research facilities in the diagnosis, treatment, or Immunization of human beings or animals, and other associated research and services.^[2]

According to notification, 1998 of the Government of India it has been specified that Hospital Waste Management is part of hospital hygiene and maintenance activities. This involves management of arrange of activities, which are mainly engineering functions, such as collection, transportation, operation/treatment of processing systems, and disposal of waste. However, initial segregation and storage activities are the direct responsibility of nursing personnel who are engaged in the hospital.^[3]

More than 3–4th of the health-care wastes are nonhazardous while the remaining proportion is potentially hazardous. According to the WHO, 20% of total waste generated by health-care activities are hazardous.^[4]

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Dental offices generate a number of hazardous wastes that can be detrimental to the environment if not properly managed. This includes sharps, used disposable items, infectious wastes (blood-soaked cotton, gauze, etc.), mercury-containing waste (mercury, amalgam scrap), lead-containing waste (lead foil packets and lead aprons), and chemical waste (such as spent film developers, fixers, and disinfectants).^[5]

The success of biomedical waste management program depends on the knowledge and practice of the Health Care Worker (HCW).^[5]

With this background, the purpose of this study was to evaluate the practical calibration and awareness of dentist and auxiliaries in disposal of hazardous biomedical waste generated during dental treatment into color-coded disposing bags at dental hospital so that depending on their attitude they can be motivated to attend training and CDE programs concerning waste management so that they will be efficient to properly segregate, disinfect and dispose hospital waste in an eco-friendly way.

Aim

The aim of the study was to assess:

1. Awareness' toward waste management policy and practices.
2. Approach toward waste management policy and practices.
3. Performance in waste management policy and practices among the private dental practitioners in the city of Vellore, India.

MATERIALS AND METHODS

Study Design, Area, Duration, and Populations

The study was a cross-sectional questionnaire-based survey which was conducted to identify the exact management problems related to the segregation, collection, transportation, and disposal of hospital waste.

The study design among general dental practitioners and dental specialists was practicing in and around Vellore, Tamil Nadu State excluding house surgeons, non-practicing dentists or dentists with the administrative job only. Data were collected during the months of October 2017–December 2017.

Inclusion Criteria and Exclusion Criteria

- a. Inclusion criteria: Dentists enrolled as a private dental practitioner, willing to participate and registered in Tamil Nadu State Dental Directory were included in the study.

- b. Exclusion criteria: Dental Practitioner who were not willing to participate, dental students under internship and private dental practitioners who were in pilot study were excluded from the study.

Sample size and techniques

A total coverage of dentists working in private clinics in Vellore and surrounding locality were involved. Lists of all private dental clinics were obtained from the directory. The total number was 150 registered and practicing dentists.

Survey Tool

The study was conducted using pre-designed, pre-tested, semi-structured, interview schedule, self-administered, and open-ended (27) close-ended (24) questionnaire with a letter explaining, the purpose of the study was distributed by the researcher. It was handed to the participants during evening clinics hours. The questionnaire originally developed by Umar and Yaro,^[6] with some modifications.

In the present investigation, first of all, an extensive pilot study was carried out at 15 dental clinics of the above-mentioned strata which were selected by random sampling technique. The pilot study provided the basic data on which the biomedical waste management system was premeditated, designed, and operated in each facility.

Participants were requested to participate voluntary after explanation of the purposes of the study. Informed written consent for their participation was obtained, and confidentiality of responses was assured.

The questionnaire was formulated into four parts:

Questionnaire: It consisted of 51 questionnaires with 2–5 responses. They were further categorized into five sections.

Part One

It consisted 5 questions of demographic division and qualification data. Dentists were asked about, age, Academic Qualifications, and years of working in Dental Clinic or Hospital.

Part Two

It consisted of 7 questions based on the assessment of knowledge on Biomedical Waste Management Policies and practice.

Part Three

Response consisted of 12 questions based questions on Biomedical Waste management.

Part Four

Response consisted of 27 questions based on Practices Biomedical Waste Management (Attitude assessment).

Part Five

Response consisted of one question based on Preventive measures taken by the health-care professionals while handling BioMedical Waste.

Participants answered the questionnaire and returned them to the researcher at the same day or the day after. It took 10–15 min to answer all questions.

Data Analysis

Data were analyzed by SPSS Version 21 (SPSS Inc., Chicago, USA). Results were presented in form of tables and figures. Comparison between variables assessed using Chi-square and Pearson correlation tests with the level of statistical significance set at $P = 0.05$.

RESULTS

The Profiles of Respondents - Table 1

Descriptive statistic of the results showed that response rate was 100% (150), the percentage of males was 36% ($n = 54$) and rest 64 % ($n = 96$) females.

The age group of participants ranged between 25 years and above. Majority of the participants in the present study belonged to age group 25–35 years 68% ($n = 102$).

Majority of the participants 67% ($n = 101$) had <10 years practice experience and 83.3% ($n = 125$) were general dental practitioners.

Biomedical Waste Management Policies - Table 2

Although majority 61% ($n = 92$) dentist had heard about guidelines lay down by the Government of India for Biomedical Waste Management, only 50% ($n = 75$) were aware of Biomedical Waste (Management and Handling) Rules, 1998 and its Amendments rules were made in 1998.

Response to Knowledge-Based Questions on Biomedical Waste Management -Table 3

About 64.6% ($n = 97$) of the respondents considered all health-care wastes hazardous.

Only 54% ($n = 81$) were aware of Indian Medical Association Goes Eco-friendly (IMAGE), and of them, only 25% ($n = 38$) knew the correct expansion of the abbreviation of IMAGE. Around 54% ($n = 81$) of the respondents correctly recognized the symbol of biohazard.

41% ($n = 62$) were reported for disinfection of BMW before disposal among them.

Responses to Practice-Based Questions on Biomedical Waste Management - Table 4

The knowledge about waste management guidelines has a significant influence on disposal of dental material 78% ($n = 117$), on disposal of protective wears 40% ($n = 60$), and human anatomical wastes 44% ($n = 67$).

It was interesting to note that most injuries 72% ($n = 108$) occurred during giving an injection, which is the most important step of the procedure. These were concerned by injuries needle 98% ($n = 147$).

With regard to prevention by Hepatitis B vaccine, 56.6% ($n = 85$) of the respondents knew about it and were inoculated.





Table 1: Social -demographic variables of respondents

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Total no of respondents		150	100
Gender	Male	54	36
	Female	96	64
Age group	25–35 years	102	68
	>36 years	48	32
Years of practice after degree	<10 years	101	67.3
	11–20 years	29	19.3
	More than 20 years	20	13.3
Academic qualifications	General practitioner	125	83.3
	Specialist	25	16.6
Type of practice (job profile)	Self-employed (private)	125	83.3
	Consultant visiting dental specialist	16	10.6
	Private practitioner (specialist) attached to Academic Institute	9	6

Table 2: Biomedical waste management policies

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Biomedical waste (management and handling) rules were first proposed in	1997	31	20.6
	1998	75	50
	1999	44	29.3
Amendments to the biomedical waste (management and handling) rules were made in	2011	50	35.3
	2013	43	28.6
	2016	57	38
Biohazard symbol was developed in 1966 by Charles Baldwin	Agree	62	41.3
	Disagree	88	58.6
Guidelines lay down by government of India for Biomedical Waste Management?	Aware	92	61.3
	Unaware	58	38.6
Regulation of safe transport of Medical waste done by?	Pollution control board of India	97	64.6
	Transport corporation of India	14	9.3
	Cannot comment	39	26
Safe management of biomedical waste is the responsibility of	Only government	14	9.3
	Auxiliaries staff	61	40.6
	Dental surgeons	75	50
According to National guidelines, the maximum time limit for Biomedical waste storage	24 h	18	12
	48 h	39	26
	Cannot comment	93	62

Table 3: Response to knowledge based questions on biomedical waste management

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Awareness of Biohazard sign/image?	Aware	81	54
	Unaware	69	46
Biohazard sign/IMAGE stand for	Designed to warn about hazardous materials	81	54
	Particular hazard, obstacle or condition is not covered by a standard sign	69	46
Which of the following is the Universally accepted symbol for Biohazard?		22	14.6
		30	20
		95	63.3
		3	2
Awareness about Biomedical waste management rules applicable to Dentists?	Aware	65	43.3
Awareness about improper waste management causes various health hazards (diseases)?	Unaware	85	56.6
	Aware	97	64.6
	Unaware	53	35.3

(Contd...)

Table 3: (Continued)

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Biomedical statement describes one type of Medical waste?	Materials that may be poisonous, toxic, or flammable and do not pose disease-related risk	20	13.3
	Waste that is saturated to the point of dripping with blood or body fluids contaminated with blood	112	74.6
	Waste that does not pose a disease-related risk	18	12
Biomedical wastes should be segregated into different categories (colored bags)?	Aware	48	32
	Unaware	102	68
Infectious waste should be sterilized from infections by autoclaving before shredding and disposal?	Agree	62	41.3
	Disagree	88	58.6
Labeling the container before filling it with waste is of any clinical significance?	Agree	27	18
	Disagree	123	82
Can any plastic bag be used for waste disposal?	Agree	21	14
	Disagree	129	86
Awareness of Amalgam separators?	Aware	58	38.6
	Unaware	92	61.3
One gram of mercury (source from dental amalgam) is enough to contaminate the following surface area of a lake?	30 acres	15	10
	25 acres	92	61.3
	20 acres	37	24.6
	15 acres	6	4

The most common problem encountered in managing the dental health-care waste was extra expenses, 63.3% ($n = 95$) of the respondents believed that safe management efforts will increase the financial burden.

Preventive Measures Taken by the Health-care Professionals While Handling Biomedical Waste - Table 5

Use of personal protective measures while handling biomedical waste was adequate among doctors 46.6% ($n = 70$).

DISCUSSION

The survey presents a grim picture. The study revealed several lacunae in the knowledge, attitudes, and practices among the health professionals. Health professionals have an ethical responsibility toward the environment and themselves. Due to the nature of their profession, they must not forget that they are at risk for treating patients who may have infectious diseases. Dentists, dental assistants, and patients may be exposed to pathogenic microorganisms localized in the oral cavity and respiratory tract, including *Cytomegalovirus*, HBV, HCV, Herpes simplex virus type 1 and 2, HIV, *Mycobacterium tuberculosis*, *Staphylococci*, *Streptococci*, and other viruses and bacteria.^[7]

These microorganisms can be transmitted to dental health-care professionals by direct contact with a patient's saliva,

blood, skin, or oral secretions, or by indirect contact through injuries caused by contaminated sharp instruments, or by droplet infection from aerosols or spatter.^[8]

Self-reported awareness about the biomedical waste management system among dentists in the present study (100%) was good.

Although the self-reported awareness was high, as much as 38.6% dentists were not registered at the local governing body. Those who had not registered were disposing of waste more commonly in dustbins.

Today, hospitals/clinics use a wide variety of drugs including antibiotics, cytotoxics, corrosive chemicals, and radioactive substances, which ultimately become part of hospital waste.

The introduction of disposables in hospitals has brought in its wake many ills such as inappropriate recycling, unauthorized and illegal re-use, and an increase in the quantity of waste.^[9]

The biomedical waste generated by hospitals and clinics can be broadly categorized as general waste, infectious waste, and non-infectious but hazardous waste. About 75–85% of waste generated in hospitals is a non-risk or general waste, which constitutes paper, cardboard boxes, plastic packaging, and kitchen waste. Infectious waste, which includes human anatomical wastes, infectious disposable plastic items, and sharps accounts for only remaining 10–15% of total

Table 4: Response based on practices biomedical waste management

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Does your hospital/clinic generate biomedical waste?	Agree	150	100
	Disagree	0	0
Amount of health care waste generated per day?	0–2 kg	133	88.6
	>2–<4 kg	10	6.6
	>4 kg	7	4.6
Does your clinic have a tie up with waste management companies?	Agree	92	61.3
	Disagree	58	38.6
Cleaning of dental suction unit recommended?	Daily	52	34.6
	Twice a week	17	11.3
	Once a week	74	49.3
	Once a month	7	4.6
Disposal of cotton, gauze and other items contaminated by blood?	Red plastic bag	75	50
	Yellow plastic bag	49	32.6
	Blue plastic bag	16	10.6
	Black plastic bag	10	6.6
Disposal of Pharmaceutical waste?	Red plastic bag	35	23.3
	Yellow plastic bag	60	40
	Blue plastic bag	25	16.6
	Black plastic bag	30	20
Disposal of Sharps waste?	Red plastic bag	25	16.6
	Yellow plastic bag	12	8
	Blue plastic bag	17	11.3
	Black plastic bag	8	5.3
	Puncture proof container	88	58.6
Disposal of excess Mercury and Mercury contaminated cotton?	Drain	21	14
	General garbage	87	58
	Plastic bags	13	8.6
	Store in glycerin	29	19.3
Disposal of the used developer or fixer solution?	Mix and discard into drain	24	16
	Mix and discard into General garbage/plastic bag	11	7.3
	Discard developer into drain, send fixer for recycling	20	13.3
	Discard fixer into drain	5	3.3
	Send developer for recycling		
	Cannot comment	90	60
Disposal of hazardous liquid waste?	Drain	36	24
	General garbage	9	6
	Chemical treatment and Discharge into drains	105	70
Disposal of contaminated dental materials (files/reamers/ burs/cements/suction tips used)?	General waste	15	10
	Improper manner	18	12
	Recommended manner	117	78
Disposal of used protective wears?	General waste	57	38
	Improper manner	33	22
	Recommended manner	60	40
Disposal of human anatomical waste?	General waste	20	13.3
	Improper manner	63	42
	Recommended manner	67	44.6
Disposal of all kinds of waste into general garbage?	Agree	27	18
	Disagree	123	82
Is needle-stick injury a concern?	Agree	147	98
	Disagree	3	

(Contd...)

Table 4: (Continued)

Individual scenario			
Variables	Respondents	Frequency (n)	Response rate (%)
Do you re-cap the used needle?	Agree	142	94.6
	Disagree	6	4
	Do not bother	2	1.3
Do you discard the used needle immediately (needle destroyer)?	Agree	50	33.3
	Disagree	95	63.3
	Have not noticed	5	3.3
Sustained a needle-stick injury during the last 12 months?	Agree	82	54.6
	Disagree	24	16
	Do not remember	44	29.3
How the most recent incident did (sustained a needle-stick injury) happen?	Poor disposal of needle	22	14.6
	Individual carelessness/accident	108	72
	Cannot remember	20	13.3
To whom the injury was reported?	Occupational health worker	59	39.3
	Nobody	91	60.6
Whether fully inoculated against hepatitis b?	Agree	85	56.6
	Disagree	65	43.3
Any previous training in biomedical waste management?	Agree	34	22.6
	Disagree	116	77.3
Biomedical waste management should compulsorily be made part of Dental undergraduate curriculum	Agree	141	94
	Disagree	9	6
Your knowledge regarding Biomedical Waste Management is adequate?	Agree	123	82
	Disagree	27	18
Any further training on Biomedical Waste Management?	Required	145	96.6
	Not required	5	3.3
Maintaining BMW records mandatory in your hospital/ clinic?	Agree	32	21.3
	Disagree	98	65.3
	Cannot comment	20	13.3
Problems faced in waste management?	Burden	35	23.3
	Financial burden	95	63.3
	No problem	3	2
	Non availability of service	17	11.3

Table 5: Preventive measures taken by the health care professionals while handling Bio Medical Waste

Individual scenario		
Preventive measures adopted	Frequency (n)	Response rate (%)
Gloves	42	28
Goggles	5	3.3
Gowns	31	20.6
Masks	2	1.3
All of the above	70	46.6

volume of waste generated in a hospital. Non-infectious but hazardous waste includes chemical waste, genotoxic waste, and radioactive waste which comprises about 5–10% of total volume of generated hospital waste.^[10]

Sushma *et al.* study showed that a substantial percentage of practitioners (47.9%) dispose dental waste without segregation and prior disinfection which exposes garbage collectors to a high risk of getting infected from health-care waste which was in accordance with the (64.4%) present study.^[11,12]

The Ministry of Environment and Forests, Government of India has notified the new draft Biomedical Waste (Management and Handling) Rules, 2011 under the Environment Protection Act, 1986 to replace the earlier Biomedical Waste (Management and Handling) Rules, 1998 and amendments thereof.^[13] These rules were aware by the HCW of the present study (61.3%).

Regarding the maximum time limit for storage of biomedical waste according to national guidelines, they were not aware of the time limit (62%) and were aware of the fact that it was 48 h which was similar to study by Sood *et al.*^[14]

IMAGE is the scheme of IMA, Kerala, for the scientific disposal of biomedical waste. IMAGE provides comprehensive service by providing training to hospital staff for segregation of biomedical waste in color-coded bags, collection of it from hospitals, transportation in specially designed covered vehicles, scientific treatment, and final disposal in the common facility.^[15] The participants were aware of the IMAGES in the present study.

In a study by Kishore *et al.* conducted a study in a teaching hospital in New Delhi some 12 years ago, only 35.9% of respondents were aware of this.^[16] However, the guidelines laid down by Government of India for biomedical waste management were concerned; it was reassuring to note that only 43.3% of the dentists were aware of the legislation applicable to hospital waste management.

More than 68% of the HCW had no knowledge about the type of waste to be collected in black, red, or yellow colored bags related to the present study. These findings were similar to the studies done by Patil *et al.*^[17] (72.5%).

Only 14% of the respondents including the dental students opined that any plastic bag can be used for waste segregation. The observation is in contrast with the results of studies done by Charania *et al.*^[18] and Sudhir *et al.*^[19] where the corresponding values were 28% and 27%, respectively.

Knowledge about color coding for infectious waste management found poor among biomedical waste management staff (32%). Uddin *et al.*^[20] found the similar result in a study at Faridpur hospital.

Sanjeev *et al.*^[21] about 40% of the respondents were aware of amalgam separators. Amalgam separators are devices designed to remove amalgam waste particles completely in dental office discharge. These separators remove the particles using different techniques such as sedimentation, filtration, centrifugation, or ion exchange which was similar to a present study (38.6%).

There are no reliable data available of the quantum of waste generated per person per day either in indoors or outdoor patient in Indian Hospital, particularly in Vellore. Even there is no uniformity in the data on the quantum of biomedical waste being generated.

The variation in the quantum of waste generation differs not only from country to country but also within the country which depends on the type of health-care establishment, hospital specialization, proportion of reusable items employed in the health-care center's and proportion of patients treated on a day-care basis.^[22]

From the data available from Singh *et al.*^[22] where the average daily waste generated from anatomical waste is 5.6 kg.

In the present study, the average daily waste particularly the anatomical waste shows high quantity, i.e. 2 kg/day.

Sudhakar *et al.*^[23] conducted among private dental practitioners in Bangalore city, India, wherein 39.1% of the respondents were not segregating excess mercury/or amalgam but were discarding it to regular Garbage. This result is similar to a present study (58%).

As far X-ray fixer is concerned, we know the fact that X-ray fixer is considered a hazardous waste because of its high silver content. Developer solutions should not be mixed with fixer solutions. The resulting solution is hazardous. The fixer can be recycled and the developer can be sewerred.

In a study by Mushtaq *et al.*,^[24] waste X-ray developer and waste X-ray fixer were not collected in separate bottles, rather they are wasted through main wastewater sewage system, therefore posing health threats it needs revolutionary changes in the ultimate fate of X-ray fixer which was in accordance to the present study (16%).

All the surveyed setups were found discharging their dangerous waste directly down the drainage waste and also thrown in the garbage.^[25-27] These results are in comparison to other studies conducted were similar to the present study.

The BMW management practices in the hospital were satisfactory, except for a deficiency in use of needle-cutters in clinics (63.3%) which were similar to the study by Mathew *et al.*^[28] and Benjamin *et al.* (41%).

The practice of reporting injuries resulting from improperly disposed of biomedical waste was found to be completely absent among the staff. Stein *et al.*^[29] in their study reported that among doctors and nurses, only 37% reported that they ever suffered needle stick injury 39.3% in the present study.

Maroof *et al.*^[30] reported that 43.3% of the study subjects had heard of hepatitis B. The BW in the hospital is more in contact with the patients and therefore at greater risk of acquiring hepatitis B and their knowledge is very deficient which was similar to the present study.

However, in the present study, the majority of respondents (22.6%) had not received any formal training in biomedical waste management. Similar result was noted by Akter *et al.*^[31] and Madhukumare *et al.*^[32] while performed similar type of research among tertiary healthcare workers.

The present cross-sectional study was carried out to assess the knowledge and practices of healthcare professionals about biomedical waste management in dental clinics. This study showed that of 150 health-care professional's doctors (82%) had better knowledge compared to other health-care professionals regarding disposal of biomedical waste, this finding was corroborated by the study done Holla *et al.*^[33] (84%).

RECOMMENDATIONS

- Adequate supplies and equipment should be available in all departments to take care of wastes.
- Collected information on various methods of disposal

and updated technology should be made available to all categories of health-care personnel.

- c. Compulsory training for their health-care personnel from accredited training centers.
- d. Easy color coding for BMW disposal bags should be developed in local languages for the betterment of sanitary workers and general public awareness.
- e. Hospital superintendents, Government Health administration, and public awareness need to pay their specific attention to this important issue of health and hygiene.
- f. Intensive training or workshops program at the regular time interval for all staff working in hospitals and clinics, and a system of monitoring and surveillance about the practice of day to day BMW management should be evolved.
- g. Proper BMW disposal practices could be accentuated in health-care personnel if they are put under direct supervision and direct surveillance.
- h. Reasonable amount of fund must be provided for waste management.
- i. There is dire need of segregation of waste at source besides following color code system of waste management.
- j. To install proper incinerators in all the cities.
- k. Universal precautions should be adapted while dealing with hazardous and infectious waste.
- l. Yielding posters with and leaflets should be used to for providing such education.
- m. Endorsing the principles of green dentistry which reduces waste and pollution, saves water, energy, and money is high-tech and supports a wellness lifestyle.

CONCLUSION

Occupational safety is a prime concern. Being a recent field of interest, the level of knowledge on this concept is insufficient and needs to be increased to raise awareness to the environmental aspects.

Protected and effective execution of waste management rules is not only a legal necessity but also a social liability.

Lack of knowledge, motivation and cost factor are some of the hurdles faced in proper waste management.

The importance of training regarding biomedical waste management cannot be overemphasized.

Health-care professionals and government should work together to develop standard feasible policies for BMW management.

The study revealed a lack of knowledge in different tiers of health-care providers which adversely affects their practice.

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CONCLUSIONS

The present study is done on a small scale. The results of this study reinforce the belief that the internet is becoming a valuable asset to the dental profession.

Tomorrow's Internet, however, may be very different from the Internet of today. The Internet's driven by a massive ongoing conversion to electronic commerce, which will drive high-speed access and more convenient connections. Dentistry can only benefit.

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