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RESEARCH ARTICLE

DENTAL LASER EDUCATION AND KNOWLEDGE AMONG FINAL YEAR DENTAL STUDENTS AT SAVEETHA DENTAL COLLEGE- A QUESTIONNAIRE STUDY

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Abstract

Aim of the study: To assess the educational level and the knowledge of the final year dental students regarding the application of laser in dentistry.
Materials and methods: This cross-sectional, descriptive study was carried out at Saveetha dental college. A questionnaire was designed and answered by 100 final year dental students. The questionnaire consisted of 2 parts. First part of the questionnaire was about dental laser education at saveetha dental college and the second part was about the knowledge of application of laser in dentistry. The second part was subdivided to 6 sections. Each section consisted of several items consisting of the uses of laser in 5 different dental specialties , and a section in laser protection. The analysis of the result was carried out by giving a score of +2 for a correct response, 0 for don't know response and -2 for an incorrect response. Student's knowledge scores were calculated and transferred to a scale ranged between -2 and +2. Score of > or =1 was considered as sufficient knowledge, while score of <1 was considered as insufficient knowledge.
Result: Most of the students (96%) reported that they did not have enough dental laser education. In general, majority of the students had insufficient knowledge regarding the uses of laser in dentistry. Student's knowledge of the application of dental laser in Periodontics was better than their knowledge in Pediatric dentistry, Orthodontics, Endodontics, Oral Surgery and Operative dentistry.
Conclusion: Undergraduate dental students of Saveetha dental college had inadequate laser education and insufficient knowledge regarding the application of laser in different specialties of dentistry. More education about dental lasers should be added to the curriculum of undergraduate program since it is highly essential for students to know about newer technologies and apply it in their practice. This study has helped Saveetha dental college to know the status of the undergraduate students of their institution about their education and knowledge on application of laser in dentistry, thereby guiding the institution to make necessary measures to include laser education in undergraduate curriculum.

INTRODUCTION

New technologies are already making their way into dental practice and have changed the traditional approaches to make the treatment easier, simpler, reducing patient's discomfort, for which education about newer technologies are necessary for undergraduate students.[1] Dental laser is one of the most significant technologies in modern dentistry. Lasers were introduced into the field of Dentistry in 1960s, with the hope of overcoming the drawbacks of the

conventional methods of dental treatment procedures.[2] Some of the drawbacks of conventional methods of cavity preparation with low and high speed handpieces involve noise, uncomfortable vibrations and stress for patients.[3] These drawbacks have led to a search for new techniques as an alternatives for dental hard and soft tissue removal.[3] Different laser devices and different wavelengths opened up various treatment options for diverse indications. Laser Dentistry is not assigned to one particular speciality, and as a result its application was extended to other specialities namely, Conservative dentistry, Endodontics, Periodontics, Oral and maxillofacial Surgery, Pediatric dentistry. In addition to its uses in hard tissue preparation (bone and tooth preparation) and soft tissue surgery, laser treatment has been used in combination with composite or glass ionomer restorations, or in the treatment of hypersensitive teeth which are examples of different applications of laser in dentistry.[4–6] Laser is also important in root canal disinfection in Endodontics and in behavior management in Pediatric dentistry.[7,8] In order to practice laser safely and effectively in different disciplines of dentistry, it is essential to have a good knowledge of laser physics, laser operation, different types of laser and which type of laser is appropriate for each case and laser protection. In view of the increasing availability of new technologies in dental practices and the need for more education and training, this survey was conducted to assess the educational level and knowledge of the application of laser in Dentistry among the final year dental students at Saveetha dental college.

MATERIALS AND METHODS :

This cross sectional , descriptive study was carried at Saveetha dental college. A questionnaire consisting of 2 parts was designed and given voluntarily to final year dental students of Saveetha dental college and the questionnaire was collected after answering for evaluating the result. The questionnaire was generated based on the dental laser types available and common applications of laser in different dental specialties. The first part of the questionnaire consisted of 10 items regarding the student's dental laser education and training in their institution. The second part consisted of 34 items (uses of laser) within 6 sections (specialities). Each section contained several items related to the uses of laser in 5 different dental specialties [Oral Surgery (8 items), Endodontics (4 items), Periodontics (4 items), Operative Dentistry (10 items) and Pediatric Dentistry/Orthodontic (4 items), some items in laser protection (4 items)].

SCORING SYSTEM:

In the second part of the questionnaire, there were 34 items in 6 sections, each item having true, don't know and false options. The questionnaire was analysed by scoring +2 for a correct response, 0 for don't know response and -2 for an incorrect response. Score calculation was performed according to the following equation:

(2*number of responses)+(0*number of don't know responses)+(-2*number of responses)/ total number of items
The scores of each student were added together giving a total overall knowledge score which could range between -68 and +68. Then the total score of each student was divided by the number of the items (34 items) and which ranges between -2 and +2. The same procedure was applied separately for each specialty section [(total score in Oral Surgery/8 items),(total score in Endodontic/4 items), (total score in Periodontic/4 items),(total score in Operative Dentistry/10 items), (total score in Pediatric Dentistry/Orthodontic/4 items),(total score in laser protection/4 items)]. The mean of the student's scores was calculated to assess the level of their overall knowledge about laser in the institution and their knowledge of the application of laser in each speciality. Score of > or =1 was considered as sufficient knowledge as it equals to 50% or more correct knowledge about laser. Score of <1 which equals to less than 50% was considered as insufficient knowledge as the score is towards incorrect knowledge about laser.

Table 1

ITEMS	**NO. OF RESPONDENT STUDENTS**	**PERCENTAGE**
GENDER:		
MALE	17	17%
FEMALE	83	83%
KNOW WHAT IS LASER	78	78%
HAD ENOUGH LASER EDUCATION	4	4%
HOURS OF DENTAL LASER EDUCATION:		
0 HOUR	96	96%
1-3 HOURS	4	4%

>4 HOURS	0	0
HAD PREVIOUS DENTAL LASER PRACTICE	2	2%
HAD INTEREST IN DENTAL LASER	77	77%
NEED FOR MORE DENTAL LASER EDUCATION	82	82%
TYPE OF LASER EDUCATION NEEDED:		
THEORITICAL	6	6%
PRACTICAL	9	9%
BOTH	77	77%
NO NEED	8	8%
NEED FOR DENTAL LASER UG COURSE	83	83%
LASER EDUCATION IN DENTAL COURSE:		
ENDODONTICS	29	29%
PERIODONTICS	78	78%
ORAL SURGERY	27	27%
PEDODONTICS	12	12%
ORTHODONTICS	13	13%
OPERATIVE DENTISTRY	33	33%
OTHERS	7	7%
KNOWN LASER TYPE:		
CO_2	42	42%
DIODE	28	28%
Er:Cr:YSGG	7	7%
Er:YAG	8	8%
Nd:YAG	0	0%
ARGON	12	12%
NONE	3	3%

RESULT : Hundred dental students (83 female students and 17 male students) returned the questionnaires with a response rate of 100%. Table 1 shows that about 78% of the respondents know what is laser. Only 4% of them thought that they had enough education about dental laser. About 2% had practiced dental procedures with dental laser outside the college. Most of the dental students has the interest in dental laser and would like to have more theoretical and practical education in this area (Table 1). Table 1 also shows that students are aware of dental laser applications mainly in Periodontics, oral surgery in undergraduate course. The most known laser types among them were Co_2 and diode lasers (Table 1). Regarding dental student's laser knowledge, Table 2 shows the student's responses of each item in each section as correct response, incorrect response and do not know response , the mean and the mean score of each section. The best score was obtained in Periodontics section(1.03), followed by Oral Surgery and laser protection sections (0.46, 0.27 respectively), followed by Operative dentistry, Endodontics sections (0.12, 0.17 respectively) and the least was recorded in Pediatric dentistry, Orthodontics(-0.09).

Table 2

LASER CAN BE USED FOR /TO	**CORRECT**	**DO NOT KNOW**	**INCORRECT**	**MEAN**	**MEAN SECTION SCORE**
IN OPERATIVE DENTISTRY:					
LESSEN THE NEED FOR LOCAL ANAESTHESIA	28	14	58	-0.62	
ELIMINATE THE NOISE OF THE HAND PIECE	56	28	16	0.80	

CARIES PREVENTION	36	16	48	-0.24	
CARIES DETECTION	48	20	32	-0.32	
CARIES REMOVAL	77	12	14	1.26	0.12
ENAMEL ETCHING	17	21	62	-0.9	
REMOVAL OF SMEAR LAYER	22	30	48	-0.52	
COMPOSITE CURING	28	32	39	-0.22	
DENTIN DESENSITIZATION	31	51	18	0.26	
WHITENING THE TEETH	43	45	12	0.62	
IN ORAL SURGERY:					
SURGICAL TREATMENT OF LARGE VASCULAR LESIONS	29	56	15	0.28	
BONE RECONTOURING	24	63	13	0.22	
REDUCING SWELLING AND DISCOMFORT	27	64	9	0.36	0.46
BLEEDING ARREST	52	21	27	0.50	
ACCELERATING WOUND HEALING	41	38	21	0.40	
ELIMINATING SUTURING AND DRESSING	33	55	12	0.42	
FRENECTOMY	48	49	3	0.90	
SOFT TISSUE CURETTAGE	42	45	13	0.58	
IN PERIODONTICS:					
CALCULUS DETECTION	44	52	4	0.80	
CALCULUS REMOVAL	63	21	16	0.94	1.03
PERIODONTAL POCKET DISINFECTION	52	30	18	0.68	
GINGIVECTOMY & CROWN LENGTHENING	89	8	3	1.72	
IN ENDODONTICS:					
DIAGNOSIS OF PULP VITALITY	32	44	24	0.16	
DIRECT & INDIRECT PULP CAPPING	46	32	22	0.48	0.17
DRYING OF THE ROOT CANAL	15	53	32	-0.34	
ROOT CANAL DISINFECTION	32	56	12	0.40	
IN PEDIATRIC DENTISTRY/ ORTHODONTICS :					
PULPOTOMY IN PRIMARY TEETH	28	59	13	0.30	
PULPECTOMY IN PRIM ARY TEETH	32	57	11	0.42	
BEHAVIOUR MANAGEMENT IN CHILDREN	12	46	42	-0.60	-0.09
ETCHING ENAMEL FOR ORTHODONTIC BRACKET PLACEMENT	14	48	38	-0.48	
IN LASER PROTECTION :					
CAN'T BE USED WITH ALCOHOL BASED MATERIALS	7	68	25	-0.36	
CAN'T BE USED WITH OIL BASED LIP PRODUCTS	12	72	16	-0.08	
MAY DAMAGE CORNEA & BURN RETINA	54	38	8	0.92	0.27
SKIN & EYES SHOULD BE PROTECTED WHILE USING LASER	48	35	17	0.62	

4. DISCUSSION:

Adequate education on newer dental technologies, theoretically and practically provides sufficient knowledge needed for students to utilise the newer dental technologies in their practice. Education given at dental college is most important for a students as it is the main source of knowledge that every student rely on and their understanding of the subject depend on the information provided by their institution.[9] This study provides

information about dental laser education and knowledge among final year dental students at Saveetha dental college. Most (78%) of the students know about the term "laser". However, this survey was designed to assess the knowledge of final year dental students of Saveetha dental college about the application of laser in dentistry. Their knowledge in laser physics, different wavelengths of laser, different types of laser and the type of laser is most appropriate for each case were not assessed in this survey. As reported by the 4% of students, only 3 hours was the average time for acquiring dental laser education given during their study in the full 5 year undergraduate course. Majority of the students did not have laser education during their course. 77% of the students had interest in dental laser. This shows that insufficient knowledge in application of laser in dentistry was related to insufficient education. This also reveals that students mainly depend on their dental college for gaining knowledge related to their subject. Majority of the students showed the interest in dental laser and only 2% of them had the chance to practice dental laser outside the college which reflects their attitude towards the discovery of new technology. Most of the information about dental laser at Saveetha dental college was provided in Periodontics due to the increased implementation. However, students have to be aware of the implementations of laser in other dental specialities. CO_2 laser was the most known type of lasers among the dental students as it is one of the oldest laser and the most widespread use for soft tissues in medicine and dentistry.[10-12] Diode laser was also a known type of laser for many students. Majority of the students (56%) did not know about the uses of laser in Endodontics like root canal disinfection and diagnosis of pulp vitality.[7,13] Most of them were not familiar with its applications in Pediatric dentistry such as pulpotomy and pulpectomy.[14] About 30% of the students had acceptable information about protection against laser. Dental laser was discovered in the mid of 1960s and its efficiency was proved at the late of 1990s, yet till now it is not implemented in the undergraduate dental curriculum neither theoretically nor practically.[2,15] Laser units are available at Saveetha dental college; however, they are only accessible for faculties and postgraduate students. Dental students should get trained with newer technologies available as there are advancements in technology to benefit dentists and the patients and the training at their institution can only help them in their practice. Nowadays, the number of dentists who are adopting laser technology in their practice is rapidly increasing, the number of companies that are manufacturing and advertising different dental lasers is also increasing and most importantly, a growing number of patients are beginning to learn about laser and its application and, therefore, they seek dentists where laser has been utilised for treatment procedures.[18] The continuous development of the dental curriculum presents a major challenge to faculty, administrators, and the students because of the high cost, overloaded schedule, increased clinical training, and changing scenario of teaching.[1]

CONCLUSION

Dental students at Saveetha dental college had inadequate laser education thereby reflecting insufficient knowledge about the application of laser in different dental specialities. Undergraduate dental students need to be provided with dental laser education supported by practical experience to make them confident about using laser safely.

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