

## Original Research

### Evaluation of Dental students' Knowledge and Attitude regarding Laser Dentistry- An Original study

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#### ABSTRACT:

**Aim-** Lasers in dentistry are one of the recent advances which are being used in clinical dentistry to overcome some of the drawbacks posed by the conventional dental procedures. The aim of this study was to evaluate the current knowledge, awareness and attitude of dental students regarding dental laser from dental college. **Materials and Methods-** A cross-sectional study was conducted among 162 dental students using a questionnaire. All observed data and outcomes were registered and data was processed statistically to evaluate the real-time knowledge and awareness levels. **Result-** Statistical analysis was completed using statistical software 'Statistical Package for the Social Sciences (SPSS)'. Authors have ensured the maximum accuracy of results by using appropriate statistical tests that have provided p values, mean, standard deviation, standard error and 95% CI.  $P \leq 0.05$  was considered as statistically significant. 137 students have interest in dental lasers. 95 students think that lasers are used in all dental specialties. 67 students think that lasers are most likely used due to the advantage of less bleeding during surgical procedure. **Conclusion:** Within the limitations of the study, it is concluded that students' knowledge and awareness and attitude about lasers was rationally fair. Dental lasers are a modern technological advancement, so repeated educational events and procedural demonstrations should be conducted to revamp the present knowledge of students.

**Key words** – Dental lasers, Diode laser, Laser safety, Cost of laser unit

Received: 12 July, 2018

Revised: 14 August, 2019

Accepted: 15 August, 2019

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**This article may be cited as:** Avhad R, Jawade R, Sharma V, Shinde S, Nag A, Subramanian S. Evaluation of Dental students' Knowledge and Attitude regarding Laser Dentistry- An Original study. J Adv Med Dent Sci Res 2019;7(9):135-138.

#### INTRODUCTION

The upcoming new technologies in all fields of the science, including dentistry are growing rapidly and luxuriantly day by day. The young clinicians are getting attracted to these technologies due to the advantages over the conventional procedures. One of the most significant developments in dentistry, which was introduced long back in the 1960s is the dental laser. [1] Laser is an acronym for Light Amplification by Stimulated Emission of Radiation. Lasers work on the principle of stimulated emission theory proposed by Albert Einstein in 1917 based on the concept of spontaneous stimulated emission theory which was postulated by Neil Bohr in the early 1900s (2). There are different types of lasers with different wavelengths, which are used for various treatment procedures in all fields of dentistry (3).

It is very much essential to have knowledge about dental lasers, how it is used and what are the types, which ones should be used in different specialties of dentistry, the safety about laser, so as it can be practiced and used whenever needed. Nowadays dental clinicians are more keen to know the better techniques, newer instruments and materials which give superior dental treatment within less time. Based on the evidence and the literature, the use of dental laser is found to be an effective device to increase efficiency, specificity, ease, cost and comfort of the dental treatment for the patients. Besides its benefits, dental lasers have disadvantages like high cost of laser unit, specialized training and education on operations of laser, different types of lasers for different procedures, disease

transmission in immunocompromised patients by laser generated aerosols, harmful to eyes (2).

Lasers have been used in all the disciplines of dentistry for the management of soft and hard tissues either as an adjunct to conventional technique or as a primary tool. Co2, diode, and neodymium lasers; employed chiefly in gingival and periodontal tissue management. Erbium hard-tissue lasers have a major role in apicectomy, surgeries, and operative dentistry (4).

The aim of this study was to create awareness of laser among dentists. Due to the increasing availability of new technologies in dental practices this survey was carried out in dentists to assess their awareness, mindset, and knowledge of dental lasers.

**MATERIALS AND METHODS**

This, descriptive study was carried out among dental students. Informed consent was achieved from the students those were voluntarily ready for participation. The significance of this study was explained in detail to all participating students. A self-structured digital questionnaire consisting of 10 questions was designed and administered to students. The link of questionnaire were delivered to the students at the lecture hall. They were also requested to respond in complete bias free manner. This study was conducted as a questionnaire study because we can get all the necessary information about personal perceptions and opinions, as well as it also enhances clarity and understanding of the subject. The questionnaire was given to 162 students from which 143 students came out with positive responses. The negative responses are mainly unwillingness to participate in the study. So total 143 students knowledge were evaluated. A self-structured digital questionnaire consisting of 10 questions was designed and administered to students. The questionnaire was regarding the student’s dental laser education and their attitude towards laser dentistry. The information collected by the questionnaire included the demographic data such as gender, year of education and questions to assess dental laser knowledge and attitude towards it. The study was done during working hours of college. The obtained data were tabulated, entered and statistically evaluated using basic statistical analysis and using the Chi-square test of SPSS program. P value less than 0.05 was considered significant (p< 0.05).

**RESULTS**

Out of total 143 students 91.5% (129 people) of the participants in the study were female, and 8.5% (12 people) were males. There was no statistically significant difference in gender distribution in the data obtained in the study. Furthermore, 65 students were from final year and 76 from third year BDS [Table 1].

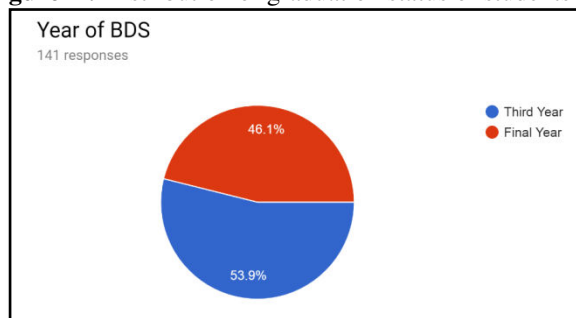
**Table 1: Demographic characteristics of the study participants (n=143)**

Variables	Subgroups	N (%)
Gender	Male	12 (8.5 %)
	Female	129 (91.5 %)
Year in which studying	Third year	76 (53.9 %)
	Final year	65 (46.1 %)

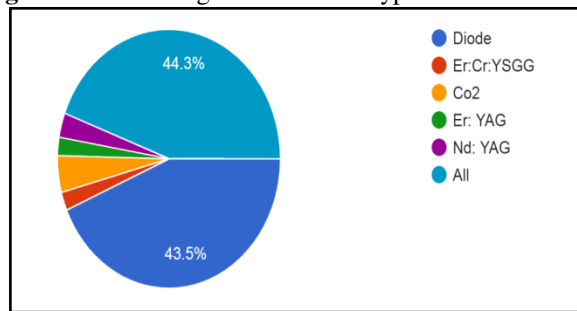
While 93.6% of the students stated that they had knowledge about dental laser systems, only 6.4% reported that they did not have any information on this subject. When asked about their interest in laser dentistry, around 97.2 % had interest regarding laser dental. Most of the students had interest in dental laser. All the types of lasers (44.3 %) that is diode, Er:Cr:YSGG, Co2, Er: YAG, Nd: YAG was the most commonly known lasers followed by diode laser (43.5 %). Most of the students, about 104 (74.3 %) had a knowledge about laser being used for both soft tissue as well as hard tissue. When students were asked about the application of lasers in dental specialties, 95 students (68.3%) know that lasers are used in all dental specialties. When the students were asked about safety protocol of dental lasers, only 62 students (44%) knows that protective barrier should be used while using lasers, the rest of the 79 (56%) gave a negative view regarding safety protocol during use of dental laser.

The question “what was the reason for using laser system was left unanswered by 3 students out of 143 participants. Less bleeding during surgery was the most common answer (47.9%) followed by less time taken for the treatment (32.9 %), less pain postoperatively (15%) and least was minimal use of local anesthesia (4.3%) were the answers for using lasers. Expensive dental laser treatment (41.7%) followed by lack of knowledge about lasers (39.6%) and cost of laser unit (15.8%) were the main reasons for lack of use of dental lasers. Around 120 (86.3%) students felt the need of more dental laser education during the curriculum. A total of 140 students answered the question that “Would you like to attend a training course/ Continuing Dental Education seminar on laser,” 97.1% answered yes and 2.9% answered no.

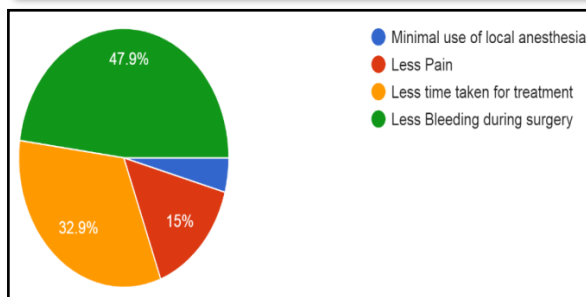
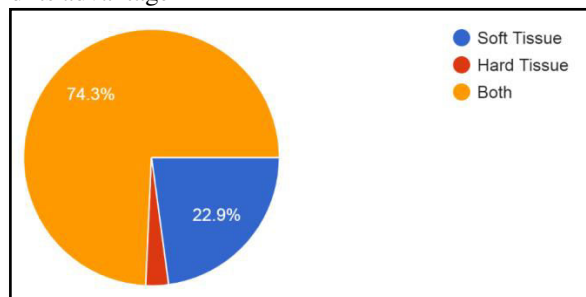
**Figure 1 : Distribution of graduation status of students**



**Figure 2 :** Knowledge level of laser types



**Figure 3 and 4 :** Students response about the use of laser and its advantage



**DISCUSSION**

Introduction of dental lasers has enabled great advancements in the field of dentistry. The laser technique severely influence the final quality of the dental procedures than the conventional ones. The study provides a general view about dental laser education and knowledge among students. This questionnaire study only assessed some basic knowledge of students regarding uses, advantages of laser. This study shows that most of the students had only moderate knowledge on laser and its applications in dentistry. This also shows that students mainly depend on their college for gaining knowledge related to the subject (5). This study was conducted on 143 dental students to determine their dental laser education and knowledge. A written questionnaire-based survey was chosen for the study as it is cost-effective, reduces bias and can be easily used for large sample sizes.(6)

In the present study, all the 132 (93.6 %) students knew what dental laser was. This finding is comparable to a study conducted by Bordea et al. which reported that 94.98% of

the study participants knew what dental laser was.(7)It is also comparable to a study conducted by Jayashree and Radhika which reported that 78% students knew what laser was, but only 2% had previous dental laser experience(8).Expensive dental laser treatment (41.7%) followed by lack of knowledge about lasers (39.6%) were the main reasons for the lack of use of dental lasers. These findings were similar to the ones reported by Bordea et al. wherein the students chose the lack of lectures in the field of laser in dentistry associated with the lack of knowledge to be the principal reason for the lack of use of dental lasers(7).Almost all the colleges have Laser units available, but they are only accessible for the college faculties and postgraduate students. Dental students should be trained with newer technologies available to benefit the patients and the training at their institutional level.

There are many applications of laser in dentistry which were not familiar to students as these applications are recently reported in the literature and proved its efficiency. Many of the students don't know about the uses of lasers in operative dentistry, for dentin desensitization, in periodontitis patients for pocket therapy. A systematic review by Sgolastra et al and Wang et al in 2011, on the effectiveness of laser therapy in treating dentine hypersensitivity reported that laser therapy has a slight clinical advantage over topical medicaments in the treatment of dentine hypersensitivity(9,10). In addition to this, most of them did not know its application in pediatric dentistry for behavior management and in orthodontics for enamel etching. Lasers provide painless treatment which can be useful for children who are afraid of needles and high speed hand piece used in dental procedures(11). Laser etching provides a better debonding of the brackets from enamel surface without fractures (12).Some institutions adopt some of these approaches, which will stimulate future changes in dental education. New curricular models will be helpful to address the interdisciplinary approach of new science within the broad oral health environment (13,14). Regarding the safety of lasers, only 44 % of students had a knowledge of using safety protocol during laser procedure. For the safety of the dentists and patients, it is of paramount importance to educate students of laser safety measures. Most of the students depend on information and training provided during their undergraduate courses. So the introduction of basic laser courses in undergraduate curriculum might increase the popularity of this new technology. This study also, more than half of the respondents (86.3%) felt that special laser course should be introduced in dental undergraduate curriculum.

Clinical use of dental lasers is also increasing day by day and hence it is important to fine more places for such topic in the dental curriculum at the graduate level. The limitation of the present study was that it was a cross-sectional study conducted with a small sample size; hence, the results cannot be generalized as there are different

teaching patterns among various universities and dental colleges across India.

### CONCLUSION:

Within the limitations of the study, it concluded that student's knowledge and awareness and attitude about lasers was rationally fair. Dental lasers is a modern technological advancement, so repeated educational events and procedural demonstrations should be conducted to refresh the present knowledge of students. It shows us that more training is needed; in this regard, that students want to improve themselves and that further research and study should be done in this regard.

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