



Educational Needs of Dental Laser as Perceived by Dental Graduates: A Survey of Knowledge and Skill Requirements

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Abstract

Objective: To assess the educational level and knowledge of the use of laser in Dentistry among the undergraduate and postgraduate students, fresh dental Surgeons and the consultants of different colleges in Karachi.

Methodology: Descriptive, Cross-sectional study was carried out at different dental colleges of Karachi using a self-administered pretested questionnaire from January 2018 to December 2018. The questionnaire consists of 2 parts. First part is about dental laser education and the second one is about the knowledge of dental laser applications. The second part is sub-sectioned to 6 sections. Each section consists of several items related to the uses of laser in 5 different dental specialties in addition to a section in laser protection. The analysis was performed by scoring 2 for a correct response, 0 for don't know response and -2 for an incorrect response. Students' knowledge scores will be calculated and transferred to a scale ranged between 2 and -2. Score of > 1 considered as sufficient knowledge, while score of <1 will be considered as insufficient knowledge.

Results: 596 participants, 20.6% were male and 79.4% were female. 32.4% students 59.4 were House Officers. 71.6% never got formal education related to dental laser while 3.7% have more than 3 hours of education. 24.7% cumulatively said they have less than 3 hours of dental laser. 88% participants believe that more education is needed regarding dental laser while 76% participant believe that it should be part of undergraduate teaching program. Enquiring about operative Dentistry mean score regarding noise reduction is 0.526 similarly highest score in operative dentistry were found in composite curing with mean score of 0.856. oral surgery highest correct mean score in frenectomy while least in large vascular lesions i.e. 1.016 and 0.134 respectively. laser protection mean correct score protection of eyes and skins was 1.140 and lowest score in 0.10.

Conclusion: Young dental fraternity is extremely deficient in knowledge related to use and application of Laser in dentistry. It is suggested that curriculum of Pakistan Medical and Dental council for bachelors of dental surgery should need to be revised and more requirement of dental laser usage and its application should be added in order to train our graduates to international standards.

Keywords: Dental; Laser; Education; Dentistry; Karachi; Pakistan

Introduction

Advances in all aspects of science and technology continue to occur at an exponential rate and have changed the traditional approaches which require that students and practitioners receive the necessary knowledge [1]. Dental laser is one of the most significant developments of modern dentistry. Laser dentistry has superseded many traditional dentistry practices, making treatments more precise, less painful, minimally invasive and less destructive. Thus, to gain the fundamental knowledge of laser therapy is important for all training practitioners [2].

Laser Dentistry is not assigned to a one particular field, it has multiple Functions. There are more than 25 uses of laser in dentistry, Including soft and hard tissue application like cavity preparation, soft tissue surgery, frenectomy, tumor removal, and whitening [3]. In order to practice laser safely, 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 [4]. Aljobair, *et al.* [5] conducted a survey related to knowledge of laser among dental student in kingdom of Saudi Arabia and followed by surveys in India but unfortunately in Pakistan no such survey was conducted.

This study assessed the educational level and knowledge of the use of laser in Dentistry among the undergraduate and postgraduate students, fresh dental Surgeons and the consultants of different colleges in Karachi.

Materials and Methods

This cross-sectional, descriptive study was carried out at different dental colleges of Karachi using a self-administered pretested questionnaire from January 2018 to December 2018. Ethical approval was taken from IRB committee of Jinnah Sindh Medical University. The questionnaire consists of 2 parts. First part is about dental laser education and the second one is about the knowledge of dental laser applications. The second part is sub-sectioned to 6 sections. Each section consists of several items related to the uses of laser in 5 different dental specialties in addition to a section in laser protection. The analysis was performed by scoring 2 for a correct response, 0 for don't know response and -2 for an incorrect response. Students' knowledge scores was calculated and transferred to a scale ranged between 2 and -2. Score of > 1 considered as sufficient knowledge, while score of < 1 considered as insufficient knowledge.

Results

This study include 596 participants, 20.6% were male and 79.4% were female. 32.4% were final year students while 59.4

were House Officers. 90% participants know what dental laser is but only 25% told that they have enough knowledge of dental laser. Most of the participants (71.6%) never got formal education related to dental laser, 24.7% cumulatively said they have less than 3 hours of dental laser education while 3.7% have more than 3 hours of education. 13.8% participant have previous experience dental laser in their practice. Around 88% participants believe that more education is needed regarding dental laser while 76% participant believe that it should be part of undergraduate teaching program

Dental students' response about their laser education and practice.		
Items	Respondents	Percent
Gender		
Male	123	20.6%
Female	473	79.4%
Level of Education		
Post graduate	49	8.2%
Undergraduate	193	32.4%
Graduate	354	59.4%
Know What is Laser	537	90.1%
Enough dental laser knowledge?	150	25.2%
Hours did you get dental laser education?		
More than 3 Hours	22	3.7%
1-3 Hours	147	24.7%
0 Hour	427	71.6%
Previous dental laser practice	81	13.6%
Interest in dental laser	458	76.8%
There is a need for more dental laser education?	523	87.8%
What kind of dental laser education do you think is needed?		
Theoretical	10	1.7%
No need	31	5.2%
Practical	90	15.1%
Both	465	78.0%
Do you think there is a need for dental laser undergraduate course?	452	75.8%

Table 1: Participants response about their laser education and practice.

(Table 1).

Enquiring about operative Dentistry questions related to dental laser usage, 41.7% consider that it eliminates noise of handpiece while 42.7% didn't know about it and 15.4% answer it's not, mean score regarding noise reduction is 0.526 similarly highest score in

operative dentistry were found in composite curing with mean score of 0.856. In oral surgery section highest correct mean score were in frenectomy while least in treatment of large vascular lesions i.e. 1.016 and 0.134 respectively. In periodontology procedure most of the study subjects consider laser to be used for gingivectomy and crown lengthening while mostly do not consider it for calculus detection. In endodontic highest score is in pulp vitality testing and lowest in pulp capping 0.0034 and in pediatric and orthodontics section, highest in etching for orthodontic brackets 0.432 and lowest in -0.255. In section of laser protection mean

correct score of protection of eyes and skins was 1.140 and lowest score in 0.101.

Discussion

In field of dentistry, laser considered as a recent advance technology in Asian Countries including Pakistan [6] but It is worth mentioning that Professional dental education in Pakistan moves around curriculum set by Pakistan Medical and Dental Council [7] and Higher Education Commission [8], which sets standards all over the country. It is unfortunate that curriculum for bachelors

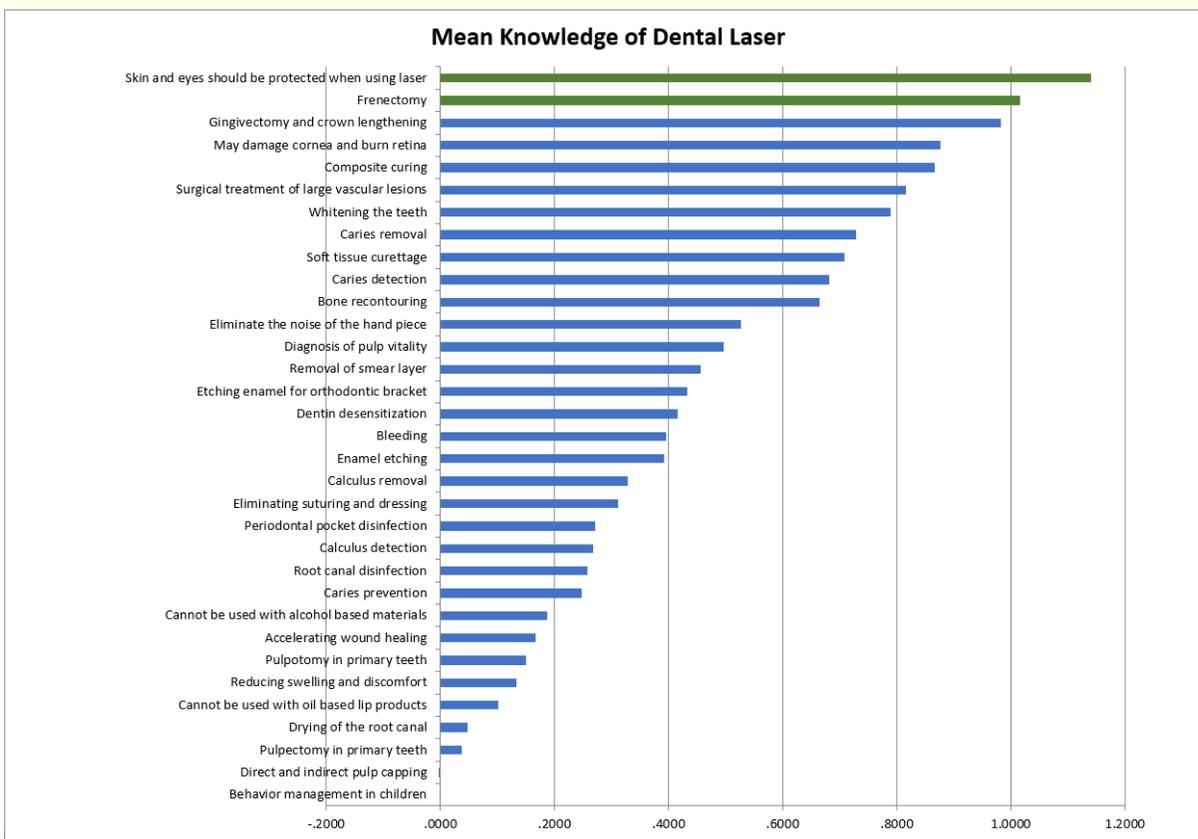


Figure 1: Mean knowledge of participants related to usage and application of dental laser.

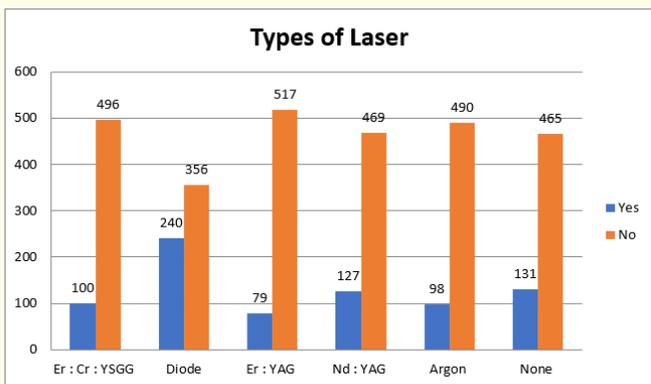


Figure 2: Participants response about type of laser based of their knowledge.

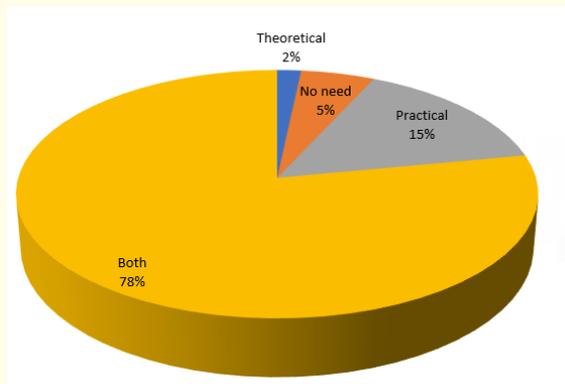


Figure 3: Participants Response regarding Dental Education for Dental Laser

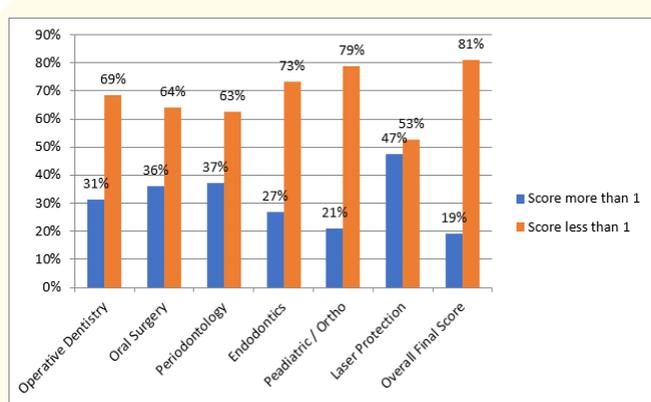


Figure 4: Participants Score based on knowledge about dental laser.

of dental surgery do not cover recent advances in sub-specialties such as dental laser. Higher education commission suggest Laser application only in Minor Oral Surgery Procedures for excision [8] while Pakistan Medical and Dental Council curriculum suggested only its introduction in cavity preparation and oncology [7] but none of the curriculum had details about its application and usage. It is a universal fact that undergraduate schooling in dentistry is the primary source of knowledge upon which young graduate relay their future. This study cover knowledge of undergraduate students, young graduate in house job, post graduate trainees, post graduates and various faculty members of different dental colleges in Karachi. This study covers the aspects of application of laser in dentistry but do not assessed biophysical principles of Laser which is a limitation of this study.

More than two third of participants 71.6% told that they didn't ever got any formal education related to dental laser, only 25% participants have one to three hours of education in their studies which is contrary to study conducted in King Saud University Riyadh where 57.4% student got 3 hours of formal education [5] and also below the study in India where 46.4% participants have no formal knowledge. Mostly participants consider diode as a laser 40% while more than 75% participants had no knowledge of other types of laser.

Literature suggested that most of the practitioners prefer diode laser due to its high absorption in pigmented tissues along with minute effect of surrounding hard tissue i.e. enamel, dentine or bone [9]. Due to which it is famous for different soft tissue procedures from sulcular debridement to gingivectomy [9].

Highest score was observed in laser protection section in which 47% participants know how to protect ourselves from laser followed by periodontology 37%, Oral Surgery 36%, Operative 31%,

Endodontic 27% and lowest in pediatric and orthodontic section but overall score dropped to 19% because of scoring system in which participants consider themselves that they know the application or usage but actually they responded wrong another research conducted in King Saud University which state that more than 50% participants had knowledge related to oral surgical procedure and least in pediatric/orthodontic section which may be due to the fact that they have laser unit available at their center [5] while Indian study mentioned highest score in Oral Surgery section but lowest in operative dentistry section [10-12].

It is evident in results that most of the respondents do not have any knowledge related to use of dental laser in behavior management of pediatric patient, pulpectomy and direct and indirect pulp capping.

Conclusion

Young dental fraternity is extremely deficient in knowledge related to use and application of Laser in dentistry. It is suggested that curriculum of Pakistan Medical and Dental council for bach-

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