

**Awareness of lasers in dentistry among general population of kalaburagi district– A survey**

<sup>1</sup>Priya Toshniwal, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

<sup>2</sup>Jayashree Mudda, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

<sup>3</sup>SR Desai, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

<sup>4</sup>Veena A Patil, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

<sup>5</sup>Bhagyashree patil, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

<sup>6</sup>Rahees, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

**Corresponding Author:** Priya Toshniwal, Department of Periodontology, S. Nijalingappa Institute of Dental Sciences and Research, Gulbarga-585 105.

**Citation of this Article:** Priya Toshniwal, Jayashree A Mudda, SR Desai, Veena A Patil, Bhagyashree Patil, Rahees, “Awareness of lasers in dentistry among general population of kalaburagi district– A survey”, IJDSIR- January - 2022, Vol. – 5, Issue - 1, P. No. 336 – 342.

**Copyright:** © 2022, Priya Toshniwal, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**Type of Publication:** Survey Article

**Conflicts of Interest:** Nil

---

**Abstract:**

**Aim of the study:** Aim of this survey was conducted to create awareness about dental lasers and its various applications in dentistry among the general population of Kalaburagi district.

**Materials and methods:** A subjective questionnaire comprising of 15 questions based on knowledge of dental lasers among general population of Kalaburagi district, Karnataka was circulated online through Google forms and hard copy of questionnaire was also distributed to a sample size of 1000, age  $\geq$  18 years including male and female.

**Results:** Among the responders, only 31.1% of the population under study had knowledge about dental lasers

**Conclusion:** In order to increase the popularity and awareness of dental lasers among the general population, dental laser practice should be implemented in routine clinical procedures along with dental health education programmes, camps, posters on dental lasers that can educate people on a large scale and can revolutionize laser dentistry.

**Keywords:** Dentists, dental lasers, survey, awareness, laser applications, laser systems, laser history.

## Introduction

Abbreviated term for LASER is “light amplification by stimulated emission of radiation”. Theodore Maiman in 1960 was the first person to develop LASER.<sup>(1)</sup> In medical field lasers have been used successfully, and are being tried in dentistry for its possible applications.<sup>(2)</sup> However, in 1990 laser dentistry came into vogue.<sup>(3)</sup> Advancement of lasers in the field of medicine and dentistry is playing a major role in patient care and wellbeing.<sup>(4)</sup> Since then, lasers have been used as an addition to traditional technique or as a chief tool in all the fields of dentistry for the management of soft and hard tissues. CO<sub>2</sub>, diode, and neodymium are some of the soft tissue lasers; that are employed chiefly in management of gingival and periodontal tissue.<sup>(5)</sup> With the evolution of esthetic dentistry and growing concern with regard to the esthetics among the general population, lasers are one of the recent advancements in the dental treatment.

In order to practice lasers safely and effectively in various disciplines of dentistry, it is prudent to have knowledge about laser physics, operation, tissue interactions and indications of lasers for each case. (Cernavin et al., 1994)<sup>(6)</sup>. In the view of increasing demand of lasers in dental practices, it is the prime duty of dental practitioners to create awareness and to educate the general population regarding various implementation of dental lasers.

Hence, our survey was conducted, in order to create awareness about lasers and its applications in dentistry among general population of Kalaburagi district.

## Materials and methods:

A questionnaire comprising of 15 questions based on knowledge of dental lasers among general population of Kalaburagi district, Karnataka was circulated online

through Google forms and hard copy of questionnaire was also distributed.

- The participants of age  $\geq 18$  years, comprising of both sexes was included in the study.
- Demographic data such as name (optional), age, sex, education, occupation, place and address were included.

**Sample size:** A total of 1000 people of Kalaburagi district will be randomly selected for the study.

## Selection criteria

### Inclusion criteria

1. General population of Kalaburagi district.
2. Participant's willingness for the study.
3. Age of  $\geq 18$  years
4. Both sexes

### Exclusion criteria

1. Dental graduates.
2. Nonresident of Kalaburagi district.

**Study design:** Case survey

Questionnaire included of following questions:

1. Have you been to a dental clinic before?  
Yes/No
2. Did you have any dental problem before?  
Yes/No
3. Are you aware of laser treatment being used in dentistry?  
Yes/No/I Don't Know
4. From where did you get to know about laser treatment that is being used in dentistry?  
Dentist/Internet/Television/Magazines/Books/I Don't Know About Lasers
5. On consultation, did your dentist provide any information to you regarding the dental laser treatment?  
Yes/No/I Don't Remember
6. Have you undergone dental laser treatment before? Yes/No

7. Are you of the opinion that special oral precautions are required before dental laser treatment?

Yes/No/I Don't Know

8. Is the cost of dental laser treatment justified?

Yes/No

9. Are you of the apprehension that dental laser treatment is painful?

Yes/No/I Don't Know

10. Do you believe dental laser treatment will have any other side effects?

Yes/No/I Don't Know

11. Do you know that lasers are used to treat decayed tooth/teeth?

Yes/No/I Don't Know

12. Do you know that lasers are used to treat gum diseases?

Yes/No/I Don't Know

13. Do you know that lasers are used as adjunct for dental implant treatment?

Yes/No/I Don't Know

14. Are you interested in knowing more about laser treatment that is being used in dentistry?

Yes/No

15. Will you attend the camps and other dental health program that will be conducted to create awareness about dental lasers among the public?

Yes/No

**Ethics:** Ethical approval of study was obtained from the ethical committee of HKE.SN Institute of Dental Science and Research, Kalaburagi.

**Statistical analysis**

Frequency analysis was done to test the responses of the individuals to the various questions based on knowledge of dental lasers.

**Results**

The questionnaire was distributed to 1000 participants (general population) of Kalaburagi district out of which 421 male and 579 female had participated and given their responses. Demographic data that was included in the questionnaire is depicted in the table-1.

Table 1: Demographic data.

Gender	Male	421	42.1%
	Female	579	57.9%
Age	Minimum	18 years	
	Maximum	59 years	
Qualification	Students	73	7.3%
	Graduates and post graduates	904	90.4%
	Home maker	23	2.3%
	Occupation	Professional	546
	Semi professional	286	28.6%
	Students	73	7.3%
	Unemployed	95	9.5%

Fig. 1: Gender wise distribution.

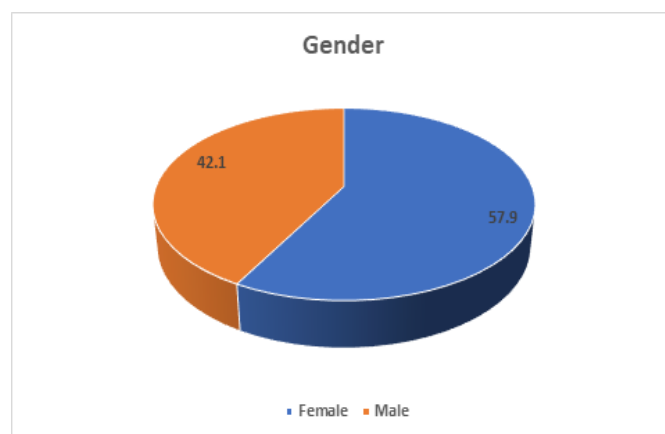
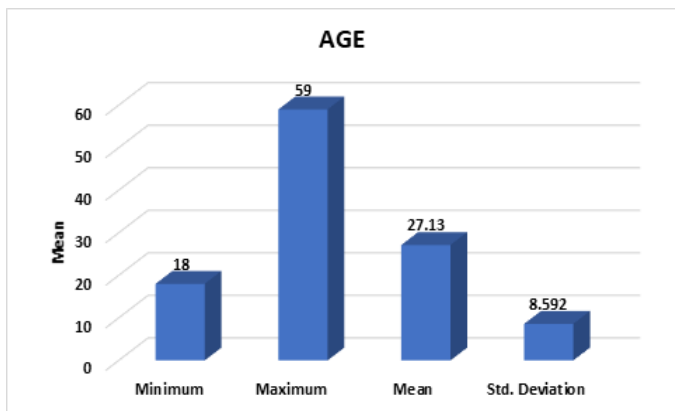


Fig. 2: Age wise distribution.



Participant’s responses regarding knowledge and awareness of dental lasers is depicted in Table-2; 641 participants had been to dental clinic before and 478 of them had visited due to dental problem. Only 311 participants were aware of laser treatment that was being used in dentistry where internet had played major role in creating awareness about dental lasers and 216 participants were updated about dental lasers by dentist yet 506 participants that is 50% of population under study were unaware about dental lasers.

Table 2: Questionnaire.

Have you been to a dental clinic before?	YES - 641	NO - 359	-
Did you have any dental problem before?	YES - 478	NO - 522	-
Are you aware of laser treatment being used in dentistry?	YES - 311	NO - 480	I DON'T KNOW- 209
From where did you get to know about laser treatment that is being used in dentistry?	Internet - 242	Dentist - 216	Magazines/books/TV - 36
On consultation, did your dentist provide any information to you regarding the dental laser treatment?	Yes - 125	No - 559	I don't remember - 316
Have you undergone dental laser treatment before?	Yes - 12	No - 988	-
Are you of the opinion that special oral precautions are required before dental laser treatment?	Yes - 172	No - 348	I don't know - 480
Is the cost of dental laser treatment justified?	Yes - 59	No - 67	I don't know - 874
Do you believe dental laser treatment will have any other side effects?	Yes - 48	No - 229	I don't know - 723
Do you know that lasers are used to treat decayed tooth/teeth?	Yes - 287	No - 165	I don't know - 548
Do you know that lasers are used to treat gum diseases?	Yes - 175	No - 220	I don't know - 605
Do you know that lasers are used as adjunct for dental implant treatment?	Yes - 194	No - 151	I don't know - 655
Are you interested in knowing more about laser treatment that is being used in dentistry?	Yes - 791	No - 209	-
Will you attend the camps and other dental health programmes that will be conducted to create awareness about dental lasers among the public?	Yes - 602	No - 398	-

Fig. 3

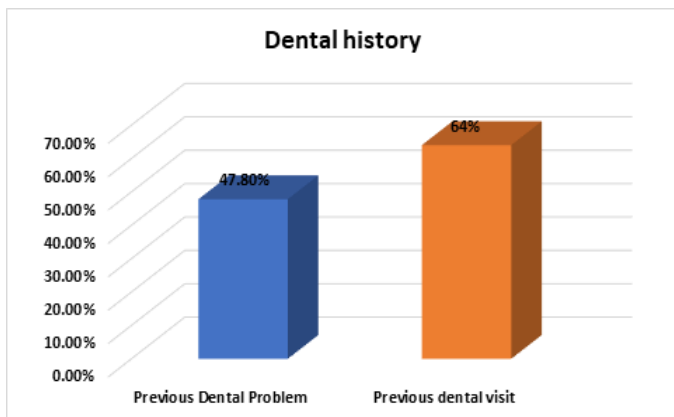


Fig. 6

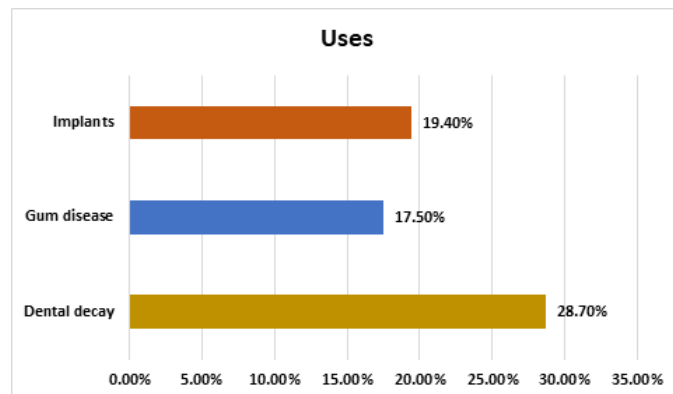


Fig. 4

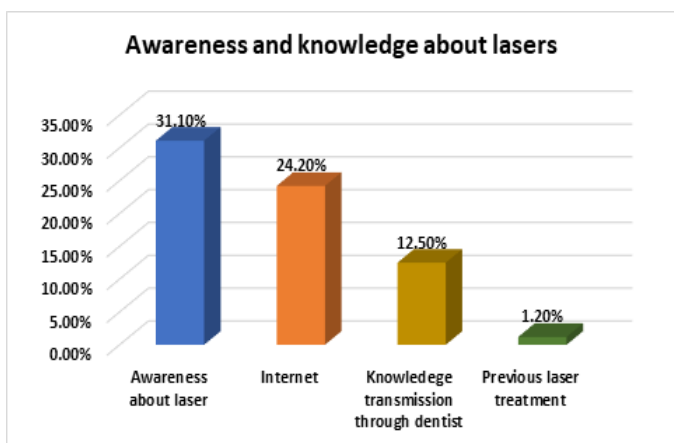


Fig. 7

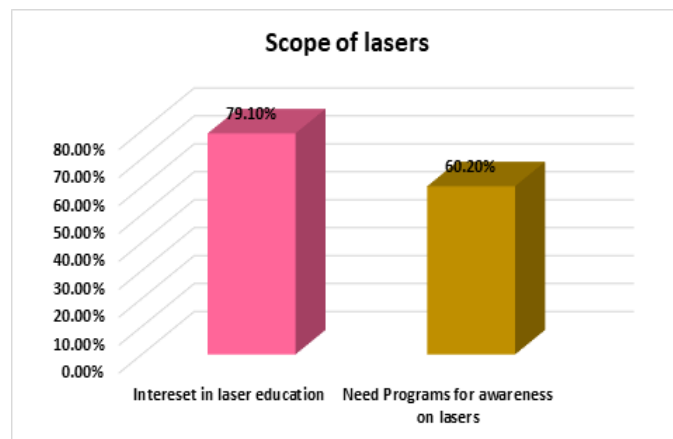
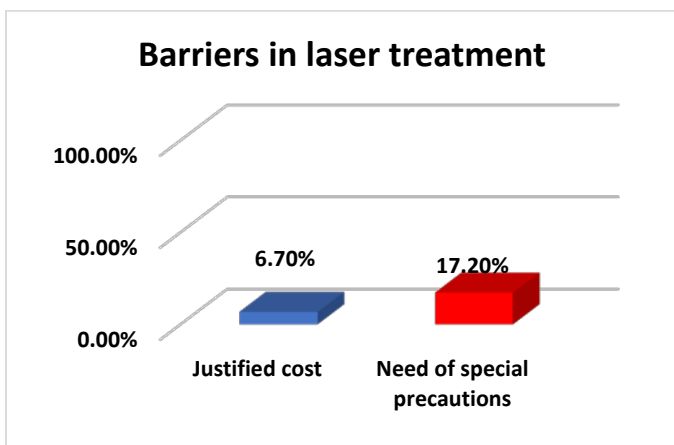


Fig. 5



### Discussion

The present survey reported knowledge and awareness regarding various implementation of dental lasers among general population of Kalaburagi district, Karnataka. A written questionnaire-based survey was chosen and circulated offline and online through google forms as it is economic, with minimum bias and can be easily employed for large sample size.

The response rate of survey was 100% which is considered excellent. Among the responders, only 31.1% of the population under study had knowledge about dental lasers as there was lack of awareness. On consultation with local dentist only 12.5% of the general population had received information about dental lasers and its various applications and the reason for this could be lack of availability of the high-cost equipment in clinics, lack of expertise and skill in dental laser practice.

According to a survey that was conducted in 2000 by American Dental Academy, reported that only 3.5% of dentists were using lasers in their private practice, and one of the reason for this could be because of their ability to get comparable outcome with traditional techniques.<sup>(7)</sup> Only 1.2% had undergone dental laser treatment of which majority of them were professionals and possible reason could be high esthetic concern with good socio economic status and possible reason for 98.8% of the general population who did not undergo dental laser treatment could be due to fear and anxiety, misconceptions about the treatment or mainly lack of education through the dentists.

Lasers can provide treatment by eliminating the use of high-speed hand pieces, needles and syringes, thereby reducing intra and post-operative pain and discomfort to the patients. Also, dental treatment with lasers eliminates the need for behavioural management therapies.<sup>(8)</sup>

Some of the laser systems used in dentistry such as ER:YAG, diode lasers has been contemplated to be most favorable in periodontal therapy as it helps in soft and hard tissue ablation without any major thermal side effects. Studies have reported that there is substantial evidence where ER: YAG lasers have proved to be comparatively more effective in calculus removal to conventional root debridement. There is one commercially available device, Key laser 3 that works in a feedback-controlled manner for the detection and removal of calculus.<sup>(8)</sup>

Most of the general population that is 48% reported that they had no knowledge regarding special oral precautions or preventive steps to be taken during and after the dental laser treatment such as use of laser safety glasses, face shield, post operative oral hygiene maintenance.

Surprisingly, 4.8% of the respondents were aware regarding the side effects of dental laser treatment such as the eye damage which includes retinal lesions, retinal burns, cataract, corneal burn and the skin damage caused by laser that includes excessive dryness, skin burns and blisters.<sup>(9)</sup>

Laser is not assigned to one particular treatment or speciality, as a result it has wide range of application in the field of dentistry, namely soft tissue surgeries, hard tissue such as bone and tooth preparation, pulpectomy, pulpotomy, treatment of hypersensitive teeth, root canal disinfection and various periodontal treatments.

Results of this survey shows that 28.7% of the population had knowledge that dental lasers can be used to treat decayed tooth/teeth, 17.5% were aware that dental lasers were used to treat gum diseases and 19.4% had knowledge of implementation of dental lasers in implant treatment.

A good number of respondents showed great interest in receiving dental laser education and its implementation through dental camps and various oral health programmes which might help to increase popularity and creating awareness about dental lasers.

Hence there is need of proper training and implementation of laser education among dental practitioners in order to create awareness among the general population.

### **Conclusion**

In the mid-1960's lasers were instituted in dentistry. Yet, lasers are not being used to their full ability. The results of this survey indicates that only 31.1% of general population of Kalaburagi district had knowledge about dental lasers. In order to increase the popularity and awareness of dental lasers among the general population, dental laser practice should be implemented in routine clinical procedures. Also, increasing number of patients

reach out to the dental clinics where laser is being practiced. However, for the practice of safe laser dentistry, there is need of proper training; various health education programmes, health camps, lectures, posters based on dental lasers can increase awareness to a great extent among general population and thereby this new technology, can transform dentistry when used to its full ability, be it diagnosis, prevention or treatment planning.

### References

1. Maiman, T. H. (1960). Stimulated optical radiation in ruby.
2. Husein, A. (2006). Applications of lasers in dentistry: a review. *Archives of orofacial sciences*, 1, 1-4.
3. Garg, N., Verma, S., Chadha, M., & Rastogi, P. (2015). Use of carbon dioxide laser in oral soft tissue procedures. *National journal of maxillofacial surgery*, 6(1), 84.
4. Thomas, G. M., Ashima, V., George, A. I., & Denny, J. P. (1993). Lasers in dentistry. *Curr Sci*, 64, 221-3.
5. Myers, T. D., & Sulewski, J. G. (2004). Evaluating dental lasers: what the clinician should know. *Dental Clinics*, 48(4), 1127-1144.
6. Cernavin, I., Pugatschew, A., de Boer, N., & Tyas, M. J. (1994). Laser applications in dentistry: a review of the literature. *Australian dental journal*, 39(1), 28-32.
7. American Dental Association, & American Dental Association. Survey Center. (2002). 2001 Survey of Dental Practice Characteristics of Dentists in Private Practice and Their Patients. American Dental Association.
8. David, C. M., & Gupta, P. (2015). Lasers in dentistry: a review. *Int J Adv Health Sci*, 2(8), 7-13.
9. Caroline Sweeney, M. B. A., Coluzzi, D. J., Penny Parker, R. D. N., Parker, S. P., Sulewski, J. G., & White,

J. M. (2009). Laser safety in dentistry: a position paper. *Journal of Laser Dentistry*, 17(1), 39.