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Research Article

Student's knowledge and opinion regarding the need of implementation of Lasers in Dental Faculty curriculum

Roxana Bordea, Ondine Lucaciu, Radu S. Câmpian
Department of Oral Rehabilitation, Oral Health and Dental Practice Management, Faculty of Dental Medicine, "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj Napoca, Romania.

Abstract. Objective: The aim of this study was to evaluate dental student's knowledge regarding the use of lasers in dentistry, in order to introduce these technologies into the curriculum of Romanian Dental schools. Material and Methods: A questionnaire based survey containing 3 parts was applied to 219 dental students from the "Iuliu Hatieganu" University of Medicine and Pharmacy in September 2014 with a response rate of 72%. Results: A large number of the respondents included in this study indicated that they need theoretical and practical courses in the field of Laser surgery in dentistry. Conclusion: This study suggests that there is a need to upgrade and integrate the knowledge of students regarding laser use in Dentistry.

Key Words: dental education, survey, lasers.

Corresponding Author: O. Lucaciu, email: ondineluc@yahoo.com

Introduction

The introduction of lasers represents a big turning point in Dentistry and now a lot of procedures are performed using different types of lasers. Nowadays lasers are incorporated into the daily practice (Dansie et al 2013).

The classification of lasers can be made according to different criteria: tissue applicability, lasing medium-solid laser or gas laser, wavelength. There are two types of lasers used in Dentistry, ones that are used only for soft tissue applications and the others that are used both for soft and hard tissue applications. In order for the laser to interact with the specific tissue there has to be a substance named chromophore which absorbs the laser beam. The chromophores found in the tissues are melanin and hemoglobin. For the soft tissue the chromophores are Melanin, Hemoglobin and in hard tissue we find water and hydroxyapatite (Verma et al 2012; Bhandari et al 2014).

The rapid evolution of laser technology in Dentistry, led to students practical and theoretical lack of knowledge in this field. Iacopino said that most new practitioners are tempted to use in their daily practice those technologies with which they worked and learned about during their dental training (Iacopino 2007). Because our students are now the millennial generation, they have to be well trained in order to know how to use all this new technologies (Evans & Hanes 2014). To obtain that, the institutions which train them should provide a proper education by including all this technologies in their curriculum.

The aim of this study was to evaluate dental students' knowledge regarding the use of lasers in Dentistry and the necessity of introducing theoretical and practical courses in their curriculum.

Material and methods

Data for this study were collected from a survey conducted among fifth year dental students from the "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj Napoca. The protocol was approved by the Ethical Committee of "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj Napoca. A number of 219 dental students were included in this study. The questionnaire was inspired partially by the questionnaire created by Dr. Asma M-Al Jobair (Jobair 2014).

Our questionnaire was divided in 3 parts. The first part solicited descriptive information about participants, such as gender and general knowledge about lasers. The second part was based on information about the use of lasers in different fields of Dentistry. The last part of the questionnaire assessed information about lasers safety, patient comfort and impediments in extending this technology.

All the data were coded and introduced in Google Forms and the results were expressed as frequency and percentage using MedCalc Statistical Software version 16.8 (MedCalc Software bvba, Ostend, Belgium; https://www.medcalc.org; 2016). In order to evaluate the internal reliability of the questionnaire we calculate the Cronbach's alpha coefficient.

Results

Of all 219 students included in the study, 138 (63.01%) were females and 81 (36.99%) were males. Regarding the knowledge of what general lasers are, 208 (94.98%) responded that they know what the laser is and only 5 (2.28%) do not know what a

laser is. The answer to the question regarding if they need dental laser lectures indicated that 160 (73.06%) respondents need theoretical and practical courses. Only 2 (0.91%) students answered that they do not need courses.
The Cronbach's alpha value was 0.823, which is considered as good internal consistency.
Regarding their interest on getting more information about the use of lasers in dentistry, 207 (94.52%) students responded that they are interested in getting all the possible information regarding this topic. Only 12 students (5.48%) said that they are not interested in getting information about lasers.
When students were asked to choose on which specialities from the Dental field they think they would need courses in order to help them use the laser, they answered as showed in Table 1. Laser surgery was ranked as the speciality in which most of the respondents need courses.

Table 1. Student's opinion regarding the need of courses in different specialities

Speciality	Yes Answers(%)
Esthetics	5 (2.28%)
Periodontics	37 (16.89%)
Endodontics	91 (41.55%)
Pedodontics	32 (14.61%)
Orthodontics	23 (10.50%)
Surgery	174 (79.45%)
Prevention	55 (25.11%)
Prosthetics	13 (5.94%)

Regarding the type of laser that fifth year dental students have more knowledge, the results showed that the diode laser is the most known laser unit. A large number of students do not know about any type of laser. Figure 1. shows the distribution of al the answers.
The answer to the question regarding the comfort of the patient with laser assisted or conventional technique is showed in Figure 2.
When they were asked which is the principal impediment in the extension of the use of Lasers, students provided the answers showed in Figure 3.
About 67.58% of the students (148) would recommend this type of treatment if they would have more knowledge about it, 24.20% (54) answered that they do not know if they would recommend it and only 8.22% (18) would not recommend this treatment.

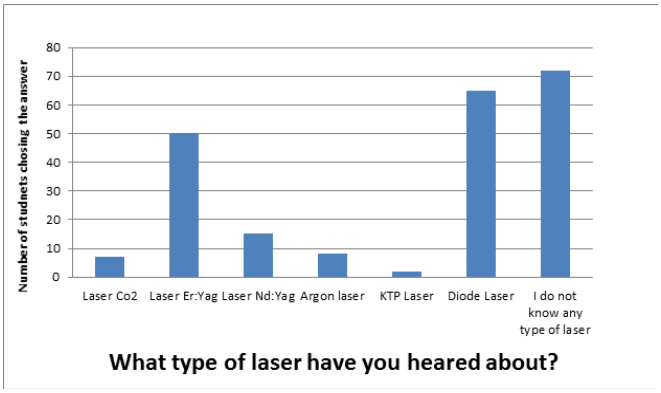

Figure 1. Student's ranking the type of laser that they heard about

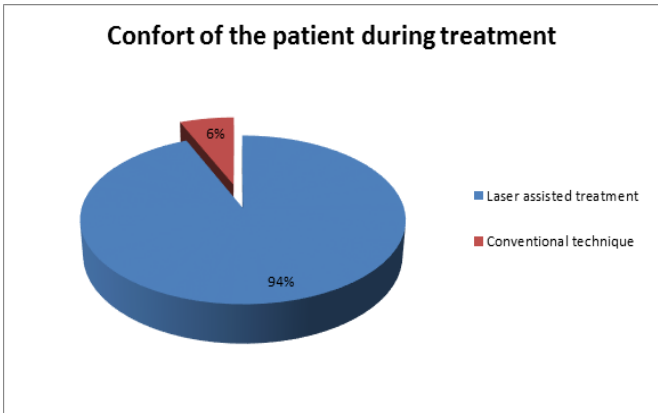

Figure 2. Percentage of responding regarding the comfort of the patient

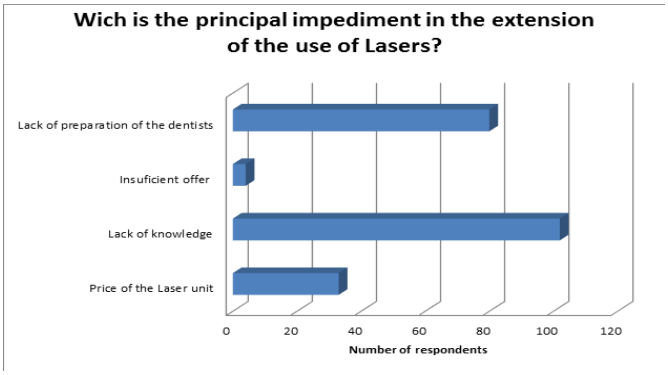

Figure 3. Student's ranking the principal impediment in the extension of the use of Lasers

Discussions

This study was conducted on a number of 219 students aiming to evaluate their knowledge regarding the use of Lasers and the necessity of introducing this technology in the Dental curricula. The results of our research demonstrated that even thou the majority of the students included in the study know what a laser is, they need lectures about the use of laser in Dentistry. The information should address topics such as the fields in which different types of laser can be used, laser parameters. Basic knowledge about the physical mechanisms that is involved in producing the laser beam is required. All this data would help them obtain better clinical outcome of the treatment and reduce de number of complications.

Tosun stated that the knowledge about laser assisted treatment methods increases with the education level (Tosun et al 2013).
Surgery and Endodontics were ranked by a big number of respondents as the fields in which they would need courses, a reason for this choices could be the rapid evolution of this fields in the last few year and the big number of classes that they have in the curricula regarding this fields.
Many types of lasers were not very familiar to the students and a lot of them didn't know any type of laser.
Our study is in accordance with the research carried out by Kravitz, who indicated that the erbium and the diode laser are the two most popular types of lasers that are used in Dentistry (Kravitz & Kusnoto 2008)
Regarding the impediments in the extension of lasers most of the students chose the lack of lectures in the field of laser in Dentistry associated with the lack of knowledge.
The majority of the students do not know the indications and the field of applications of Lasers in dentistry. They are interested in learning more information about this technology and integrating them after they finish their dental education. In different situations nowadays student's seam to trust technology more than human judgement (Renne et al 2013)
The research carried out by Nkenke et all evidenced that with the amount of medical information that is doubling every seven years, education will be increasingly dependent on information technology to enable teachers and learners to cope with the growing amount of information necessary to keep up-to-date in their field. Additional future research will allow increasing the depth understanding of using technology to enhance teaching and learning effectively (Nkenke et al 2012)
As demonstrated by Iacopino et all and Masella et all incorporat¬ing learning experiences that provide students with greater exposure to research and evidence-based practice represents an emerging area of educational reform that has been negatively perceived by most dental faculty. These approaches make the new science available to a large population of students and clinical faculty who may be motivated to apply new knowledge and technolo¬gies to patient care. As additional institutions adopt some of these approaches, this will stimulate further changes in dental education. Additionally, at the very least, this curricular approach will enlarge individuals point of view, giving them the possibility to understand the value of new science to the dental profession. New curricular models will need to address the in¬terdisciplinary integration of new science within the broad oral health environment (Iacopino 2007; Masella & Thompson 2004)
Brownstein et al consider that Dental schools are responsible for educating future dentists about new technologies. Especially considering the high cost of dental education, in¬corporating new technologies into the curriculum gives students a greater return on their academic investment—one that will ultimately affect their future practices and patient care (Browstein et al 2015).
Student's attitudes toward Dental field can impact their receptivity to training and their subsequent involvement (Autio-Gold & Tomar 2008).
The limitations of our study are regarding to the response rate, the group was limited to the students that came from "Iuliu Hatieganu" University of Medicine and Pharmacy. The selection bias that is introduced because of the voluntary nature of our survey is one of the weakness of it.
More research should be conducted in order to help incorporating this technology more efficiently and rapidly into the dental school curricula.
Follow-up surveys could monitor the penetration of this technologies in the curricula and the benefits that result from introducing them.

Conclusions

The field of dental medicine is incorporating continually new technologies, that is why students and young dentists have to stay current to all that is new in their field.
A structured academic environment is the best place to give the proper learning methods that are necessary for selecting the new technologies and know how to use them in the benefit of the patient.

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Authors

•Roxana Bordea, Department of Oral Rehabilitation, "Iuliu Hatieganu" University of Medicine and Pharmacy, 15 Victor

Babes Street, 400012, Cluj-Napoca, Romania, EU, email: roxana.bordea@ymail.com

•Ondine Lucaciu, Department of Oral Rehabilitation, "Iuliu Hatieganu" University of Medicine and Pharmacy, 15 Victor Babes Street, 400012, Cluj-Napoca, Romania, EU, email: ondineluc@yahoo.com

•Radu S. Campian, Department of Oral Rehabilitation, "Iuliu Hatieganu" University of Medicine and Pharmacy, 15 Victor Babes Street, 400012, Cluj-Napoca, Romania, EU, email: rcampian@email.com

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