

Impact of Smart Electronic Devices in Contemporary Dentistry- 'Tech-Knowledge-Y' in Dentistry

Sujithra Sudenthiran¹, Vanmali Ankita Ganesh¹, Sri Harinee¹ and Mathew Jacob^{2*}

¹Intern, BDS Student, ²Reader, Department of Oral Pathology, Vinayaka Mission's Sankarachariyar Dental College, NH-47, Sankari Main road, Ariyanoor, Salem - 636308, Tamil Nadu, India; docere_mathew@yahoo.co.in

Abstract

Change is the necessary part of life. In fact, "the only thing constant in the world is-CHANGE". Change happens in every aspect of our lives. In today's world where digital devices have caused a new era to begin, this has caused a tremendous change in each and every field present. The change from telephone to mobile/smart phone; from letters to email; from hard copy to soft copy form of storage; from low resolution to high resolution camera and so on. The change is drastic. Now the question is will these technologies bring any change in contemporary dentistry? The present article surveys the impact of smart electronic devices in contemporary dentistry.

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1. Introduction

With the evolution of smart devices at economical prices to the common man, its dependency has invaded into every aspect of our lives. Professional's reliance on devices such as scheduling day to day activities and official networking are few examples of its dependency, almost on the verge of addiction. Such an influence is also observed among dentists and aspiring students during the course of their study. A few dental programs around the globe have mandated laptops in the course curriculum. The shift of traditional teaching to contemporary problem based learning requires students to update their knowledge with the current technology and practice of dentistry. In today's world where there is a great advancement in the field of dentistry, the digital revolution that is transforming every aspect of world, it is also impacting dentistry, medicine in many ways, from electronic record keeping and data analyzing and the revolutionary treatment options¹.

2. Aim

- To study the impact of electronic devices on contemporary dentistry.
- To identify the most commonly used electronic devices in dental field.
- To identify the need to incorporate photography in dental syllabus.

3. Methodology

A total of hundred participants which includes undergraduate are students (from first year to internship), post-graduates students and practitioners were included in this study. Students and practitioners were classified into two groups based on exposure to clinical cases. A questionnaire was prepared to be distributed to the students and practitioners and a sample of the questionnaire is shown in Figure 1. All participants were given twenty minutes

*Author for correspondence

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QUESTIONNAIRE

1. Do you think electronics(laptop/camera /mobile/tab/i pad) plays an important role in modern dentistry?
 Yes
 No
2. If yes; how do you think it plays an important role in dentistry?
 Data collection
 Studying/Analysing
 To educate the patient
 Shade selection in prosthodontics
 Communication
 All of the above
3. Do you think usage of these electronics device brought any possible impact to your practice or study purpose?
 Yes
 No
 Justify your answer, _____

4. Do you think Ug's /Pg's / practioners should own a high resolution camera(DSLR) to assist them with their academics/practice?
 Yes
 No
5. If not high resolution camera do you think mobile phone camera can perform similar to a DSLR camera ?
 Yes
 No
 If no, why _____

6. Do you think communication with mobile phones had really create an impact on dentistry?
 Yes
 No
 Not really
7. Do you feel the need to own a laptop for academics/ education purpose?
 Yes
 No
8. Do you feel the cost High Resolution Camera (DSLR) is worth spending for academics?
 Yes
 No
9. Do you feel the need to in-cooperate photography for dental syllabus?
 Yes
 No
10. In which of the following fields is it more useable?
 Oral medicine
 Oral pathology
 Oral surgery
 Prosthodontics
 Periodontics
 Pedodontics
 Orthodontics
 Endodontics
 Public health dentistry

ANSWER IN PRESPECTIVE OF PRACTITIONER

11. Is it necessary to own a laptop/tab for clinical purpose /practitioner?
 Yes
 No
12. Which one of the way is easier for data collection and record keeping?
 Laptop
 I-pad
 Hard copy
 Justify your answer/choices _____

13. Which one of the following do you prefer to educate the patient/student?
 Models
 Pictures/Videos
14. Which one of the following has created more impact on clinical practice ?
 Laptop
 High resolution camera(DSLR)
 Mobile camera
 Tab/i-pad
15. Which of the following do u feel has created more impact on academics?
 Laptop
 High resolution camera(DSLR)
 Mobile camera
 Tab/i-pad
16. Do you think high resolution camera will still be useful after your studies when you are practicing/during your practice period?
 Yes
 No
 Justify your choice, _____

Figure 1. Questionnaire.

Table 1. Inferences from questionnaire

S.No	QUESTION	UNFAVOURABLE (0-35%)	MIXED (36-65%)	FAVOURABLE (66-100%)	JUSTIFICATION
1.	Role of electronic devices in dentistry	3%		97%	Easier to collect and manage data. Studying /analysis of cases made easy
2.	Impact of electronic devices in dentistry	12%		88%	
3.	Role of DSLR camera in academics and practice.	28% DSLR has better function than mobile phone		72% Mobile phones camera can function similar to a DSLR	Recent mobile phones produces images of good clarity and quality but DSLR camera has superior functions.
4.	Role of DSLR after academics.		37% DSLR is not useful after academics	63% DSLR can be useful after academics	DSLR camera has better clarity and function and can be useful in every other aspect of life
5.	Need to incorporate photography in dental syllabus	33%		67%	Gaining basic knowledge about photography would be possible
6.	Easier way to collect data	15% Hardcopy is better way of data collection		85% Prefers Portable devices	Easy to manage and store data
7.	Best method to educate patient and student	33% Learning through Models		67% Visualization through videos and pictures	
8.	Type of Electronic device which has impact on academic and clinics.	62% Portable devices			Portable devices are easy to carry around and to store data.
		22% Mobile phones			Mobiles phone helps in communication with patients and cameras in mobile phones is useful for taking photos.
		16% DSLR camera			
9.	Impact of electronic device in each field	22% Prosthodontics	55%-Oral Medicine		
		20% Periodontics			
		18% Pedodontics			
		35% Orthodontics	38% - Oral Pathology		
		25% Endodontics			
13% Public health dentistry					

to answer the questionnaire provided to them. Following which the answers to each question were consolidated and the percentage has been shown in Table 1.

4. Discussion

The electronic revolution, referred to as the technological or industrial revolution has completely changed the entire world. It is no doubt that without the help of most electronic devices it is impossible to accomplish most of our daily task efficiently and dentistry is not an exception when it comes to electronic revolution. Electronic devices such as laptops, digital cameras, mobile phones, tablets have influenced our lives to such an extent that we cannot work efficiently without them.

In our study, participants were asked to answer questions in the survey, structured to obtain an unbiased opinion of students and staff in application of electronic devices including smartphones and its utility in various aspects of managing and communication with patients. Most participants including staff favored the inclusion of electronic devices in the practice of dentistry as is seen in the Table 1 and have been discussed in the subsequent paragraphs.

Impact of electronic devices on contemporary dentistry is huge and to validate this statement, many undergraduates, post-graduates students and practitioner have agreed that laptops have been very useful to assist them in collection and management of data's of patient and cases as can be seen in Table 1. Moreover, it helps in studying and analyzing cases, treatment planning and education of patient. Also, easy visualization of pictures and videos with the evolution of CBCT, laptop is a must have tool to assist a practitioner.

Apart from laptops, smart phones also have great influence in modern dentistry. It is a valuable tool without which communication with patient would be burdensome. 69% of the participants, i.e., students and practitioners felt communication with smart phones had really created an impact on dentistry. With the help of smart phone devices, communications with patient such as appointment making has been made easy. Communication among dentists and lab assistants also became easy with the help of mobile phone. A million thanks to Alexander Graham bell for the invention of telephone. Nowadays, most mobile phone also have 2-in-1 function in which can function as camera with hardware and software settings

that enable dentists to take photographs at a professional level. The appearance of hard and soft tissues present in oral cavity may be quickly and easily photographed with the help of cameras, thus facilitating the communication among dentist, physician and laboratory². 72% of participant who took part in this questionnaire thinks that mobile phones can function as a camera to visually record clinical features almost on par to high resolution cameras.

Although, many have agreed that DSLR has far more superior and more advanced function compared to mobile phone cameras, they are comfortable with using mobile phones camera because of its reasonable price. According to undergraduates and postgraduate's students, the cost of DSLR is too high and if one could afford the cost of DSLR, then the cost is justified as it produces images with better quality and clarity³.

Result obtained from the questionnaire suggest that electronic devices mentioned above plays a major role in studying and analysis, treatment planning, collection of datas and photos of cases which gets referred to Oral medicine and radiology, followed by oral pathology, orthodontics, oral and maxillofacial surgery and other speciality of dentistry (Figure 2).

To achieve a good digital dental photograph, standardization is very important, i.e., consistent lighting, exposure, patient positioning, perspective, depth of field and background². Therefore, students and practitioner also believe that incorporating photography as a subject into dental syllabus would benefit the upcoming dental graduates. Incorporating photography as a subject would definitely help students to take better pictures as they would have some basic knowledge about photography which will eventually help them in their private practices or further studies later on⁴.

5. Conclusion

With the advancements, software customizations and "user-friendliness" of electronic devices, professionals in all fields are dependent on so called smart devises to perform optimally, including dentists. The present survey was conducted based on observations of dependency of electronic devises by dentists in private practices and students in the academic realm. The survey showed that staff and students did acknowledge the presence of smart devices and its potential role in private practice and academics.

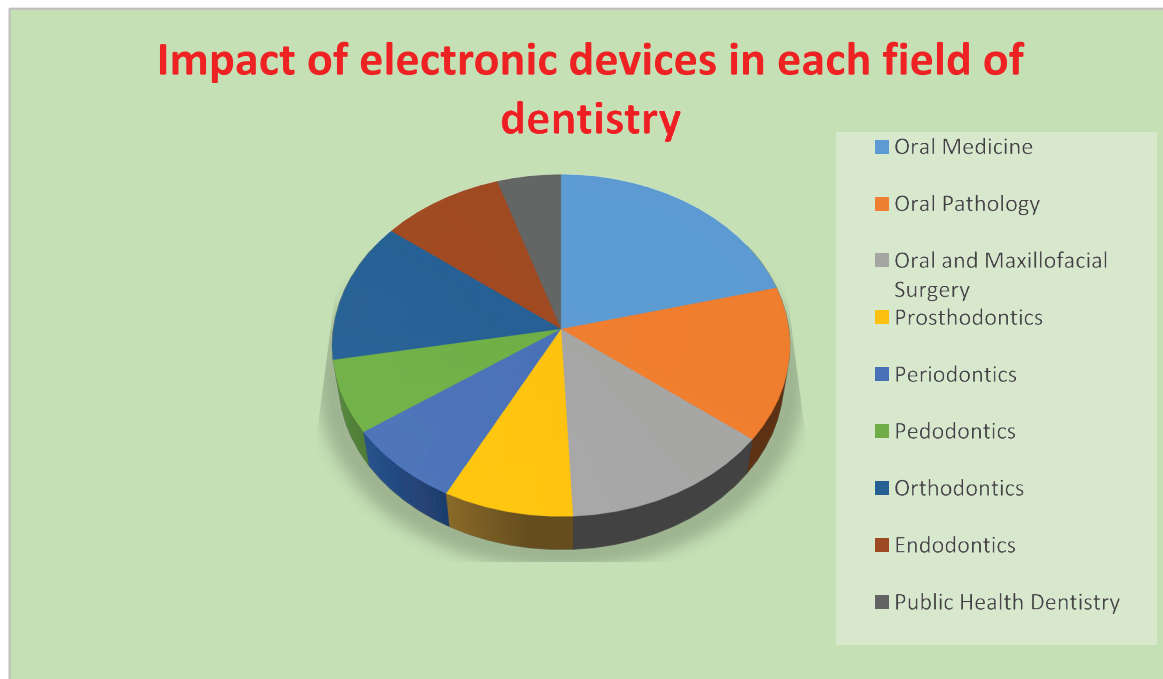


Figure 2. Impact of dentistry in each speciality of dentistry.

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