



# DIGITAL TECHNOLOGY AND PERIODONTICS: HOW MUCH WE ENTERED IN DIGITAL WORLD? A cross-sectional survey.

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**ABSTRACT-** The aim of this survey was to identify the awareness and availability of the advanced and digital instrument among the Periodontist and implantologist and the extent of the digitalization they are using in everyday practice. A questionnaire set of 31 was created on Google forms and forwarded with link on Whats App. Hundred periodontal practitioner were included in survey and result were collected in the digital pie diagram. It was one month survey during 1<sup>st</sup> to 30<sup>th</sup> October 2019. The result were in percentage which showed the uses were not much influenced by digitalization.

**KEYWORDS-** Survey, Technical digitalization, Technologies, Awareness.

## INTRODUCTION-

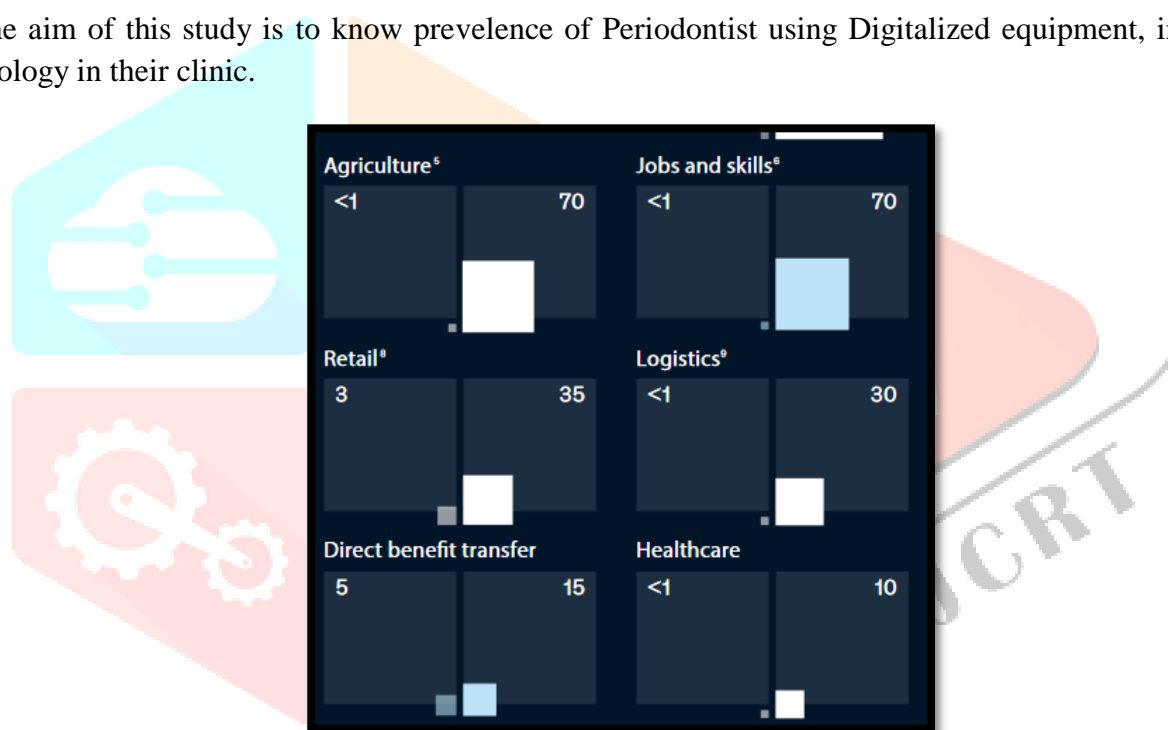
We are in the era of digitalization, Where every day we see the change and up-gradations of technology growing consistently. Digital devices and their functioning made our work easier and became the key gateway of accessing knowledge and information. According to McKinsey Global Institute (MGI) India is on its way to becoming a digitally advanced nation[1]. Just over 40 percent of the populace has an internet subscription, but India is already home to one of the world's largest and most rapidly growing bases of digital consumers. It is digitizing activities at a faster pace than many mature and emerging economies.(2018). where as in health sector digitalization emerging slowly it will have maximum potential value will be 10 only by year 2025.(fig.1)[2]

The World Health Organization (WHO) expects that digital technologies will provide a major contribution in improving public health (World Health Organization 2018)[3]. Periodontics being a preventive branch of proceeding disease should contribute to the vastly emerging digitalization in health care.

Digital equipment in can be use in the medical history, clinical examinations and comprehensive patient data (e.g. Radiographs,CBCT,OPG) may be recorded digitally. In dental practices, it offers the same advantages in the administrative work.Periodontics point of view important instrument like Pressure sensitive probe, Intra oral camera, CAD/CAM, Periotest instrument, are not widely available and in used.In addition easy in keeping record. Use for everyday periodontal practice gives an easy and comfortable ways for the management of data, appointments, and billing.

The importance of diagnosis for the treatment by the digital instrument are introduced decades before, still how much our branch has entered in the digitalization and able to make the equipment affordable, is a question yet.

The aim of this study is to know prevalence of Periodontist using Digitalized equipment, instrument & technology in their clinic.



( Fig-1.)

## Material method

This survey included the 31 question divided into three section of questionnaire set. In first section, the information was given about the aim and objectives of the survey and second section including the questions about the equipment and availability taking from very simple to the instrument which periodontist should have in clinic or at working places.In the third section, included about the method of keeping case record, awareness about patient information, views about using technology and up-gradation. This survey was done in English language. Periodontist in the region of Maharashtra state, India were included. Their phone number available on social media (whats app) was made available from the Indian Dental Association (IDA).

This survey was economic and pocket friendly as it was designed, made and done with the help of online portal available as Google Forms, which required only mail ID log in for the use. The link was created and forwarded along with a message written to the available numbers of Periodontist. Online database was

provided with a submission of a response text to the dentist individually. Voice call was also done to individual dentist for the verification and for their confirmation, whether the survey was authentic and done for study purpose.

This survey was forwarded to the 100 periodontist on their official number registered on whats app from the date 1October 2019 and the time was given of one month that is upto 30 october 2019. In between for the reminder the text message were sent for the response submission.

With each question in the set image was provided for the easy understanding and option were given to choose (fig-3) multiple option selection was made available. Response for each question was recorded separately. Percentage of Periodontist responding to the question and using the equipment was recorded and seen in two different data format that is one in pie-diagram( fig-4)and table format.

Fig-2 Question asked

fig-3 result in pie diagram.

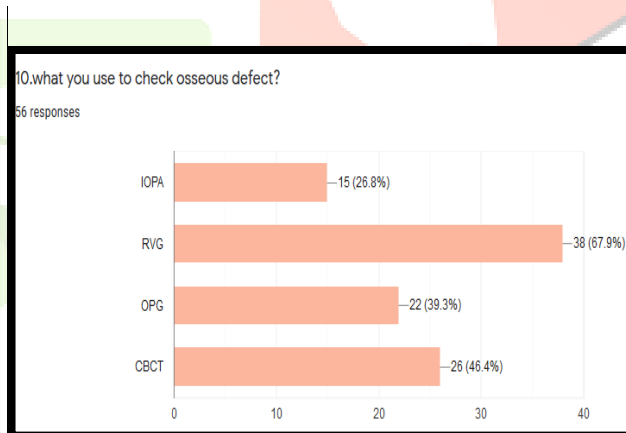
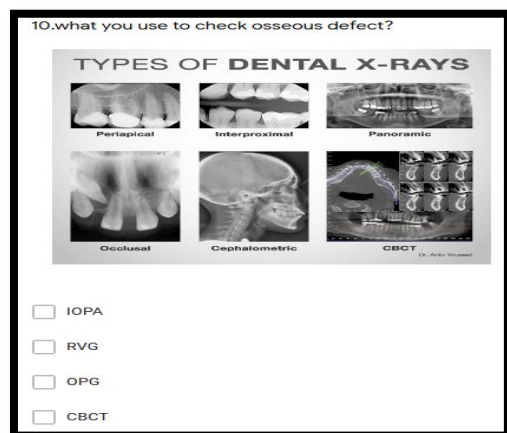
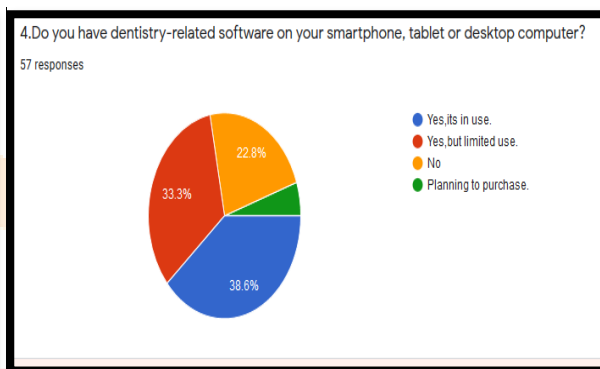
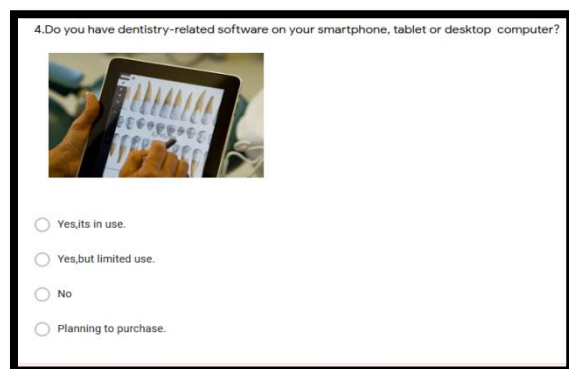


Table :1. Section-1: questions of equipment and availability from simple to the instrument which periodontist should have in clinic or at working places. Answers were given in option A0-A4.

Question	A1	A2	A3	A4
1.Do you own and use a smart phone in your private life ?	Yes	No	Continue	for limited use
2.Do you use smartphone, tablet or desktop computer for clinical & professional work?	Yes	No	For special cases only	For appointments only
3.What do you use for clinic and professional work?	Smart phone	Tablet	laptop	Desktop
4.Do you have dentistry-related software on your smartphone, tablet or desktop computer?	Yes,its in use..	Yes,but limited use.	No	Planning to purchase
5.Does your practice have a digital news feed (e.g. newsletter)?	Yes	No	Only for camp.	For advertisement
6.Do you use a computer software for patient's treatment orientation (e.g.giving idea about treatment to be healed)?	Yes	No	For some patient.	For all new patient
7.Do you use Pressure sensitive probe in clinical practice?	Yes	No	It is available and use for some cases.	It is available and not in use
8.Do you use Electronic periodontal probe for diagnosis?	Yes	No	It is available and use for some cases.	It is available and not in use.
9.Do you have periost instrument to check osseointegration of dental implant?	Yes	No	For few cases yet.	Not for any case yet
10.what you use to check osseous defect?	IOPA	RVG	OPG	CBCT
Section 2 method of keeping case record,awareness about patient information,views about using technology and upgradation.				
11.Do you have digital radiographs?(eg.RVG)	Yes	Yes, available and in use.	No, have old radiographs machine.	Referred to general practitioner
12.Do you use CBCT ?	Yes	No	Yes, for some cases.	
13.In which condition you take CBCT?	Implant planning.	Periodontal condition	Oral lesion	Endodontic purpose
14.How do you interpret CBCT?	Myself	Take help of Radiologist.	Ask information from report	Discuss with colleague

			expert	
15.Do you use intra-oral camera?	Yes .	No	It is available and in use.	It is available but use for some cases only
16.Do you use additional software for patient treatment/ planning ?(eg.CAD-Cam)	Yes	No	For few cases yet	Not for any case yet
17.Do you use digital photography for pre/post operative difference?	Yes	No	For very few cases.	For aesthetic cases only.
18.How do you keep case record?	Written format.	Writing on prescription pad.	Record in the corporatized format	Record for special case only
19.Do you record periodontal charting?	Yes	No	For very special cases.	For maintenance cases
20.Do you use and share essential's with patient?(eg.Radiographs, pre/post operative photographs)	Yes	No	For patients who ask shearing	For every patients
21.Do you give digital record prints to your patient?(eg.Case record,treatment plan record,digital billing)	Yes	No	Yes but not in digital form	
22.Do you use social media to be in touch with your patient?	Yes	No	Yes for some patient.	Yes for every patient.
23.Do you notify your patient for appointment by social media?(eg. whats app,other app)	Yes	No	It is fixed at dental visit.	Give a call to patients on appointment date
24.How do your patients react to digital systems in your dental practice?	Positively	curiously	They think treatment will be expensive.	Negatively
25.How do you deal the increasing influence of computer-aided dentistry?	Positively	It seems difficult.	Patient is less responding.	Neutrally .
26.Do you attend webinars?	Yes	No	Sometimes	Not attended during practice yet
27.Do you prefer e- reading journal online?	Yes	No	Sometimes	

28.How do you check changing digitalization in periodontics?	Social media.	Society Website	Journals	At conferance.
29.Are you satisfied with the digital systems in your dental practice?	Yes	No	It is useful for practicing.	It is useful in improving practice
30.Why do you use digital technologies in your dental practice?	To increase efficiency.	For extension of the treatment indications.	No digital technology available	Available but not in use
31.Are you planning to increase the grade of digitalisation in your dental practice?	Yes Already Using and finding it beneficial.	No	Planning and finding it expensive	Satisfied with the things we have

## RESULT-

This survey was completed successfully as forwarded to the 100 practicing Periodontist in the region of Maharashtra state. The survey was completed in the allotted duration of 30 days. The total number of completed survey was fifty-eight, which were received through the online filling into Google forms. Recorded response was in the percentage of dentist using the facility.

Majority of the dentist were doing single handed practice and with hospital organization, where few were in academics as working in institution. 4% of Periodontist were pursuing for PHD doctor of philosophy.

More than 90% periodontist use smartphone & other equipment in like laptop and desktop. 37.5% Periodontist have dentistry related useful software in practice. 60.7% of Periodontist have digital news feed for notifying people. 30.7% Periodontist uses digital media like videos for treatment need, motivation for patient orientation. Periodontist must have instrument i.e pressure sensitive probe this instrument is not used by 96.5% Periodontal peticioner. Only 1.8 % use Electronic periodontal probe. Only 3.6% Implantologist uses periotest instrument to check osseointegration. 67.9% uses RVG for osseous defect & 53.6% are using RVG routinely for radiographs. 54.5% use CBCT for cases. For implant 92.1% use CBCT. For the interpretation only 57.1% interpret CBCT by their own. Only 57.9% takes preoperative and postoperative photograph. Not more than 8.8% have additional software eg.CAD-CAM. For data collection only 33.3% use digitalized case format. Only 36.1% use periodontal charting for record. For patient awareness and knowledge only 42.1% share digital record with patient. Actively 57.9% be in socially touch with patient. Notifying appointments to patient digitally is done by 45.6% practitioner. Patient 67.9% & 94.6% periodontist taking digitalization positively. Webinar attended by 35.7% Periodontist. 62.5% read E-journal for knowledge and upgradation. 34.5% use social website for new technique information. 89.3% are trying to use digitalization for increase efficiency of practice.

## Discussion -

The obtained numbers from the survey stated that digital involvement is not regularly available to extent and practiced. Digital appliances of social media are commonly available but not in use for the up-gradation in practice. Smart phones are commonly available almost from past two decades in low price still not separately in use for the practice beneficiary. Software related to dentistry and application are available in play stores but are not in use for the special cases and treatment to publish and advertise the clinical practice, very few practitioner have digital news feed like software, whereas sector like agriculture is widely using it for different schemes. For the information of the treatment going to be held the orientation of patient is not done, as lack of awareness in the patient. In the exclusive practice as Periodontist the instrument like second generation probe, which were introduced in 1988 and with the modification uptill 1994 were introduced [3]. Gibbs et al<sup>18</sup> in 1988 pressure sensitive probe, is not widely available due to price and cases indication awareness. Similarly in case of electronic periodontal probe which is in introduced by Polson in 1980 also known as Yeaple probe after 3 decades isn't available [4]. Noninvasive device called the Periotest (periotest, Siemens AG, Bensheim, Germany) was used to monitor the implant stability (Olive and Aparicio, 1990; Teerlinck et al., 1991) to check ossiointegration and even after modification, only few implantologist are using it [5]. CBCT technology has developed rapidly since it was first used in 1982 at Mayo Clinic Biodynamic Research Laboratory and CBCT is mainly indicated for the evaluation of hard tissues in the Dentomaxillofacial complex which is important for the maxillary implants and having the vast use it is not easily available for Periodontist [6]. Due to lack of this very few practitioner are familiar with interpretation of the CBCT, for interpretation they send it to the expert. Camera are easily available still many don't take pre operative and post operative photographs, if this record is maintain the work done can be acknowledge. The CEREC (Central Electricity Regulatory Commission) System (Sirona) was the first chair-side CAD/CAM system in dentistry and is currently available in its third product generation [7]. In 2006, Mormann given importance of routine use, still it is not available after two decades.

Nowadays, the method of data collection has been transformed from paper to E-paper, all sector companies and association has converted their data into E-data. Here, in health sector it seems the previous and going on data are in paper forms only. Very few Periodontist use digital case format and share the data with patient, such are in very less numbers. Periodontal charting in periodontal cases as well as in implant cases it's always a better was to check for treatment progression and follow up still it is not done widely. We are easily connected with the social media and to internet as free Wifi, less data charges and almost spend much of hours on the internet, but hardly Periodontist use it to in socially touch with patient and to notify them for appointment with easier way.

Patients and doctors taking digitalization positively, but due to uneconomic prizes and not easy of availability things to do for advancement are pending. Coming to the awareness doctors aren't paying much attention on easy and new advancement and treatment modalities very few attends webinar and few check social sites. As lack of needful treatment awareness in patient, as patients are unaware it is again the job of the practitioner to keep them update.

To increase the efficiency of practice the awareness in patients as well as the availability of instruments should be available for well established and ethical practice.

## Conclusion -

Above survey data has given us an idea about prevalence of digitalization periodontal practitioner. To move with the time we need more research on equipment and instrument today which are not cost effective and un-available .we have to make them compatible ,easy to handle and affordable which will help to diagnose and treat precisely and accurately. Which will save time and money of practitioner and they can provide best treatment to their patient in their practice.

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