



KNOWLEDGE AND AWARENESS OF DIGITALLY PROCESSED COMPLETE DENTURES AMONG DENTAL PRACTITIONERS – A QUESTIONNAIRE BASED SURVEY AMONG SUB URBAN CHENNAI

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ABSTRACT **Aim :** To evaluate the knowledge and awareness of students and practitioners regarding digital complete dentures and its clinical usage. **Materials and Methods:** 103 participants were included and a pre typed questionnaire was given to them and their answers were recorded and analyzed. **Introduction:** Digital designing technology has simplified the process of fabrication of complete denture. Complete edentulism is a debilitating condition that negatively affects a person's well-being. There is a wide array of treatments for complete edentulism, and each option has its advantages and drawbacks. **Results: Conclusion:**

KEYWORDS : Digital Dentures, Dental Practitioners, Complete Dentures, CAD CAM

INTRODUCTION

Complete Edentulism is growing in the general population as there is an improvement in lifestyle and increase in the life span. Though implant supported complete dentures are currently considered as an alternative but may not be applied to the general population due to anatomical physiological or financial restrictions.(1)

Since its introduction in the 1980s, digital dentistry, as a spinoff of digital technology and robotics, has revolutionized many aspects of the dental practice. (3,4) (aristeidis)

Fabrication of CDs is no exception. It has been more than 25 years since the first publications about the utilization of computer-aided design and computer-aided manufacturing (CAD/CAM) methods for complete denture (CD) fabrication Jaw movement and the relationship between mandible and maxilla can be reproduced with dedicated computer programs, which are usually incorporated in the most recent dental CAD software packages These computer programs are called virtual articulators and the user interface usually conveniently corresponds to the features of the traditional articulator models that are combatable with the CAD software. (5-9)

MATERIALS AND METHODS

This cross sectional study was a questionnaire survey which contained 10 close ended self directed comprehensive questions which were framed and circulated among post graduates, under graduate students and dental practitioners.

The questions were generated as online survey forms and circulated via the internet (google forms). in total 103 respondents were selected and the survey was conducted from January 2022 to January 2024 in Chennai city. Responding to the questionnaire did not require any consent as answering was online and with implicit consent. Among the respondents 59 were students ----- (add pg and ug) and 44 were dental practitioners with practice experience ranging from 1 to 10 years. Most of the respondents were within the age of 40 and so the sample can be considered as young population.

The questionnaire mainly consisted of questions regarding the awareness of digital software and fabrication of digital complete dentures. The responses were assigned a control number and it was entered in the excel format . Once the data was entered, the author reviewed the entries to check for the accuracy of the data. The clarity , competency , consistency and validity of the octane data was reviewed at a regular basis. Data was analysed using SPSS statistics software (.)

The questionnaire survey had 10 questions and the population surveyed were dental practitioners , post graduates and interns. A short introduction was given to all the participants A short introduction was given to all the participants on this topic. The questionnaire was circulated within sub urban parts of Chennai.

A total of 103 responses were recorded over the given time. The 103 responses consisted of 59 students including post graduates and under graduates and 44 dental practitioners. The questionnaire mainly consisted of questions regarding the awareness of digital software and fabrication of digital complete dentures. As economical factor plays a major role in Idigital dental workflow, questions regarding the expenses for both the patient and practitioner were questioned about.

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Table 1: Questionnaire used in the Survey and the Results Obtained

Do you utilise computer software to manage patient records?

Q1	Yes	No	Total
Student – PG /UG	46	13	59
Dental Practitioner	24	20	44

Have you received training for any kind of digital dental workflow?

Q2	Yes	No	Total
Student – PG /UG	19	40	59
Dental Practitioner	19	25	44

Are you aware of various other methods of fabrication of complete denture apart from the conventional method?

Q3	Yes	No	Total
Student – PG /UG	26	33	59
Dental Practitioner	18	26	44

Do you recommend digitally processed and scanned dentures to your patients?

Q4	Yes	No	Total
Student PG/UG	54	5	59
Dental Practitioner	35	9	44

Do you think economy plays a role in the way patient's select their denture?

Q5	Yes	No	Total
Student – PG/UG	56	3	59
Dental Practitioner	43	1	44

What is your knowledge about the chairside time difference factor in fabrication of conventional complete denture vs digital denture?

Q6	>Greater	<less	Total
Student – PG/ UG	43	16	59
Dental Practitioner	27	17	44

Do you believe that incorporation of digital technology is helpful for saving time for patients in dental clinic?

Q7	Yes	No	Total
Student PG/UG	57	2	59
Dental Practitioner	42	2	44

Have you noticed any changes in the accuracy of the impression/prosthesis between conventional and digital dentures?

Q8	Yes	No	Total
Student PG/UG	45	14	59
Dental Practitioner	30	14	44

RESULTS

The survey was conducted for the sub urban population of Chennai which consisted of 103 subjects. The average age ranged from 21 to 40 years . the reponses obtained from all groups was 100 % without any failure of reponses. In total 59 students (both post graduates and under graduates) with 44 dental practitioners.

For the question regarding utilisation of digital patient records 44 % of the students answered positively while 13 gave negative answers. Among the practitioners 24 % of them utilised digital patient records. As. CAD CAM dentures requires knowledge of digital dental work flow the respondents were questioned regarding their training in digital

dental workflow for which 19 % of the students and practitioners .

CAD CAM dentures are alternative to conventional denture fabrication and so the respondents were about the awareness regarding other methods of fabrication of complete dentures. 26 % of students were aware of other techniques and 18 % of the practitioners were aware.

Digital scanning is one of the modalities of creating complete denture impressions and so the subjects were asked regarding their opinion for recommendation of digital processing of complete dentures for which 54 % of the students and 35 % of the practitioners gave a positive response. As regards to the role of economy in play in use of CAD CAM dentures 56% of the students considered cost as an important factor and 43 % of the practitioner felt that economy plays an important role.

The convenience of using CAD CAM is based on reduced chair side time. The subjects were asked about their knowledge regarding the different steps in fabrication of digital dentures as compared to conventional dentures. 16 % of students and 17 % of the dental practitioners thought that it takes lesser time for digital dentures compared to conventional dentures.

43 % of students and 27 % of dental practitioners felt that digital dentures took greater time for fabrication which indicates that they did not have complete idea of the digital work flow.

The concept of CAD CAM dentures was introduced to reduce the chair side time and so the subjects were asked that if they believe that incorporation of digital technology will be helpful for saving time for the patients . majority of the students (57) and practitioners (42) felt that digital technology was useful.

CAD CAM dentures are a new technology and hence the opinion regarding the accuracy of the impression and prosthesis were questioned to the subjects. 45 of the students and 30 practitioners responded positively and felt that the use of digital technology will result in more accurate restorations.

The 9 th question was an open ended practitioners and students were asked about their overall opinion regarding the use of CAD CAM dentures in place of conventional dentures. The respondents typed their opinions and gave a positive attitude towards the use of CAD CAM dentures.

Chi squared test with Yates correction was performed to compare the statistical difference based on the response of the students and practitioners. The p value for Q1 was .0 to 109 and was statistically significant. For all other questions from Q2 to Q9 p value was < than .05 and hence not statistically significant.

DISCUSSION

As digital technology is growing day by day there is a constant need for improvement in conventional techniques. Conventional fabrication of complete dentures is cumbersome both for the patient and the practitioner. Hence CAD CAM dentures have been introduced. This study attempted to find the acceptance of the new technology among dental practitioners.

A questionnaire was distributed with various aspects of CAD CAM technology for complete denture and undergraduates, post graduates and practitioners were asked to respond to it.

The knowledge attitude and awareness of dental students and dental practitioners was evaluated using a questionnaire. The overall results of the study shows that post graduate students had better knowledge regarding current developments like digital dentures and use of computerized software in practice. These results contradict the previous study done by Mohammed et al. among Egyptian dentists who showed significantly lower awareness scores (mohammed ashraf ali cross reference)

The reason could be due to the demographic area chosen for the study and differences in dental curriculum in that country. The results how ever coincide the study done in Saudi arabia (mohm. Cr 18) which showed high level of knowledge among interns and post graduate students.

The reason could be that these countries are using more of digital

education in their curriculum. The study conducted by Ramesh nayakkar was revealed that teaching faculty had better exposure to digital knowledge as compared to practitioners.

In this study it was found that most of the current students as well as practitioners have an exposure to software technology. The reason for this was the sample population was taken from the urban and sub urban area and hence likely to have greater exposure to software technology.

The sample population was a younger population with most subjects below the age of 30. In this study the post graduates had better awareness compared to the general practitioners. This results are similar to the results done in the study in Switzerland which concluded that younger dentists were more into digitisation. CAD CAM dentures will improve the efficiency and type of patient care given by the practitioners. However, most practitioners in this study were not particularly aware about CAD CAM dentures. These results are similar to the study done by harini et al (saveetha cr) where most of the practitioners were not aware of the usage of intra oral scanners.

The use of CAD CAM dentures is not an absolute reality due to the financial constrictions in acquiring the technology for manufacture. Hence economy plays a major role which decides the affordability of the patient to choose CAD CAM dentures and knowledge of the practitioner to have the skill to do it. With regards to economy both students and practitioners felt that it was the major obstacle in use of CAD CAM technology.

The reason for the limited knowledge seems to be the high initial investment cost for procuring the technology.

The end of the survey open ended question was given to evaluate the acceptance of CAD cam dentures as an alternative to conventional complete dentures. Most of the practitioners suggested that they would practice the new technology and felt that cad cam dentures had a better fit and lesser chair side time and reduced appointments for the patients. Except for the fact that the treatment was expensive all other criteria were accepted by both practitioners and the students for the use of digital technology.

Limitations of the study include a small sample size and study conducted only in the urban and sub urban areas.

Better insight could be known if a larger population would be covered. However within the limits of the study it can be understood that current dental education among post graduate students is equipping them for better use of digital technology. Since these students are going to be the future practitioners we can be vouched safe that CAD CAM dentures would in the future be used as an option to conventional complete denture therapy.

CONCLUSION

Within the limits of this study , it was found that the knowledge and awareness of dental students was better than practitioners regarding digital complete denture. It was found that post graduate qualification gave better exposure to digital technology. According to this study general practitioners had lesser awareness and require more exposure to digital technology. As regards to the final outcome most of the respondents agreed to the use of CAD CAM technology as an accurate and good alternative to conventional complete denture . It may be safely concluded according to this study that in the future CAD CAM technology will be more accessible and prevalent as a treatment modality for completely edentulous patients.