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Awareness, attitude and knowledge of computer aided design/computer aided manufacturing (cad/cam) among dental professionals

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Abstract

Background: High demand for aesthetic and metal-free restoration has developed the potential to minimize the inaccuracies in conventional techniques which helps the dentists in developing restoration faster, easier and more perfect. The purpose of the study was to assess the awareness, attitude and knowledge of computer aided design/computer aided manufacturing (CAD/CAM) among dental professionals.

Materials and Methods: A questionnaire study was conducted among dental professionals. A structured, self-administered, close-ended questionnaire was designed to collect the data which consisted of two parts and comprised of 31 questions related to knowledge, attitudes and practices in CAD/CAM among dental professionals. Cronbach alpha value was 0.751. Statistical analysis was done using descriptive statistics.

Results: In this study, there were a total of 178 participants out of which 158 were of age group 23-35 years and 25 were of age group 35-45 years while the rest were from 45+ years and above. Around 73.6% of the participants were aware of CAD/CAM system while others were unaware or not sure. About 39.7% of participants have used CAD/CAM system in their clinical practice while others have not.

Conclusion: Most of the participants were aware and interested in CAD/CAM technology but they have insufficient clinical knowledge and practice.

Keywords: CAD/CAM, computer aided design, computer aided manufacturing, dental professionals, questionnaire study, technology

Introduction

Over the last two decades the demand and application of computer aided design/computer aided manufacturing (CAD/CAM) technology in the field of dentistry has rapidly increased [1]. CAD/CAM technology was launched in 1960's for the purpose of aircraft and automotive industries [2]. In 1971, Dr. Duret was the one who introduced CAD/CAM technology in dentistry and in 1983 first CAD/CAM restoration was made [3]. Mormannu and Brandestini developed CERAC system in Zurich, Switzerland. Name CERAC system means Ceramic Reconstruction CERAC was responsible for popularity and growth of CAD/CAM in the field of dentistry [4]. The ability of CAD/CAM to provide same day chair-sided restoration is a catchy procedure for the patients as well as dentist. The high demand for aesthetic and metal-free restoration has developed the focus on the production of high strength ceramic in dentistry which may only be used with CAD/CAM technology [5]. CAD/CAM technology was mainly introduced to solve three main challenges associated with the restoration, first was to create the restoration with natural appearance with adequate strength and making the procedure of the restoration faster, easier and more perfect with sophisticated steps [6]. This CAD/CAM technology which is used in both dental office and dental laboratories can make the restorations inlay, onlay, veneers, crowns, fixed partial denture, bridge works, implants, abutments, even full mouth restorations. CAD/CAM technology is also being used in branches of Orthodontics in the form of invisalign retainers [7]. CAD/CAM technology reduces the number of appointments for the patients and saves the time but also produces reliable and effective restorations [1].

More than 30,000 of dentist around the globe are having their own scanning and milling machine of which 10,000 are in United State and Canada. Worldwide more than 15 million chair-sided economic restorations of aesthetics ceramic have been done but, still the budding dentists are unaware of this technology [6]. CAD/CAM system in dentistry basically consist of three components: The first component is CAI (Computer aided inspections) the device which reflects the prepared teeth and adjacent supporting tissues and is responsible for spatial data digitalisations. The second components consist of computer which plans and calculate the body form/design of restorations. The third component represents the numerically controlled milling machine which forms the basic shape and produced dental restorations corresponding to CAM area [8]. Present day advanced dentistry have led the use of CAD/CAM technology in special restorations including designing and fabrications of complete dentures, the information to this can be achieved through cast or direct impressions. With the further advancement, CAD/CAM technology has the potential to minimize the inaccuracies in conventional techniques and thus reducing the hazards of the infectious cross-contamination associated with multistage fabrications of indirect restorations [7]. CAD/CAM system is divided into three types based on the locations of the CAD/CAM systems: a) In office system a chair-sided CAD/CAM system, b) Laboratory based system, c) Centralized fabrications [9]. Most common CAD/CAM system are: a) CERAC-chair-sided economic reconstructions of aesthetic ceramics, b) DCS precedent consist of laser scanner, c) CERCAN, d) Procera all ceram system, e) CICERO system (computer integrated crown reconstructions) [3]. The purpose of the study was to assess the awareness, attitude and knowledge of computer aided design/computer aided manufacturing (CAD/CAM) among dental professionals in Western Maharashtra, India.

Materials and Methods

A questionnaire study was conducted on study participants in Western Maharashtra. The study objectives were to access awareness, to access attitude, and to access knowledge regarding use of CAD/CAM technology. The study participants were selected based on the following inclusion criteria: a) 25 years and above age groups, b) Those that were willing to participate in this study, and c) Dental graduates. Medically-compromised, mentally-challenged, children, etc. were excluded from this study. The input parameters for sample size calculation using G*power software version 3.1.9.2 as follows: 80% power of study, alpha error 0.5, effect size 0.4 and degree of freedom 5. The calculated sample size was 168. The final considered sample size for study was 178. The convenient sampling technique was used in study. The questionnaire was prepared in English language. The questionnaire was pretested and validated among 20 study participants to assess their knowledge, clarity and responsiveness. The reliability statistics were calculated and the Cronbach Alpha was 0.686. The Performa was designed to collect data and consist of different section based on 31 questions. Section one included the demographic data of subjects such as name, age, location, gender etc. The second section included questions related to the knowledge of study participants and third section was attitude based questions, whereas final section included practice-based questions. The questionnaire was designed on Google form (Google LLC, Mountain View, California United States) and the link was distributed among general population on Email, WhatsApp

and other social media platform. A brief introduction about the study was given and informed consent was taken from all study participants. Data collected were entered in a spreadsheet (Microsoft Excel, 2016). The statistical analysis was done using descriptive statistics. Statistical Package for the Social Science (SPSS) 23.0 version software (IBM, Chicago, Illinois, United States) was used. The P value was set at 5%.

Results

In table 1, there were a total of 178 participants out of which 158 were of age group 23-35 years and 25 were of age group 35-45 years while the rest were from 45+ years and above. There were 105 female participants and 73 male participants. Majority of the participants were BDS (57.1%), MDS were 42.9 %. 78.6% of participants are private employee were as 19.8% participants are working in hospitals and 1.6% participants are government employee. In table 2, 73.6% of the participants are aware of CAD/CAM system that it can be used in all the branches of dentistry, whereas 23% participants are only aware of uses of CAD/CAM system in prosthodontics branch of dentistry. Around 73% of the participants thought that the disadvantage of CAD/CAM system is high cost equipments and extended training whereas 6.9% of the participants were not sure. In table 3, 73.5% of the participants agreed that CAD/CAM system can be performed by CAD/CAM experts only while the others disagreed to it. Around 73.6% of the participants are aware of CAD/CAM system while 31.6% were neutral and 2.2% of participants disagreed to it. Around 39.7% of participants have used CAD/CAM system in their practice whereas 60.3% participants have not used it in their practices. Around 90.5% participants are interested in installing CAD/CAM system in their practices was as 9.5% were not interested.

Discussion

In the past few decades, the tremendous increase in demand of highly aesthetic and metal-free restoration has become the reason for the popularity of the CAD/CAM technology.⁵ Now a days, dentists are very lucky and we should be thankful to the CAD/CAM technology and various studies regarding advancement of this technology. It resulted in making exceptionally faithful restoration which are not only aesthetic like natural teeth but also biocompatible [8]. Till date CAD/CAM technology has been used in the production of various types of restorations including inlay, onlay, crowns, veneers, multi-unit (FPD) and implants, abutments full mouth restorations and complete dentures and also used in orthodontics as invisalign aligners, orthodontics splints, fabrication of removable denture and maxillofacial prosthesis, guided implant surgery, orthodontic surgery and guided bone regenerations [1, 7].

In the present study, about 67.1% dental professionals are aware of the CAD/CAM technology in dentistry which is little better than (64.4%) the study conducted by the Maltar M *et al.* [2] (2018). It is good that the percentage of dentist knowing about CAD/CAM technology is high. In current study of Western Maharashtra, only 27.6% of the dentist has CAD/CAM system as a part of their curriculum and majority (63.2%) of them do not have CAD/CAM in their curriculum, remaining 9.2% professionals are not knowing whether their curriculum contains CAD/CAM or not. Similarly, according to Palanisamy S *et al.* [6] (2019) only 18.3% are showed that their curriculum contains CAD/CAM system in it. But in same study, 42% of third year and 53.20% of final year

students stated that their curriculum contains CAD/CAM system in it, it seems that academic is improving.

In the present study, about (88.2%) majority of dentists are aware the applications of CAD/CAM technology in crown and bridges, inlay, onlay, veneers, denture and implants supported restorations. Only 12 and 4 out of 178 dentists thought that only crown and bridges, inlay and veneers can be made through CAD/CAM technology, which is a good thing that the dentist in the Western Maharashtra are very much aware about the applications of CAD/CAM technology in various branches of dentistry. But according to the Nassani M Z *et al.* (2021) [1] only 42% of dentists thought that CAD/CAM technology can be used in fabrication of crown. But it seems that majority of them are unaware about its applications (15.8% bridge, 26.3% veneers, 9.6% implants and abutments). About 24.7% and 41.4% of the participants in this study have strongly agreed and agreed to the fact that CAD/CAM fabricated crowns are far better than the conventional fabricated crowns in all aspects, whereas according to the survey of Nassani M Z *et al.* (2021) [1] around 28.1% of the participants agreed to the fact that those CAD/CAM fabricated crown are much better than those fabricated by conventional technique and 18.4% participants stated that CAD/CAM fabricated crowns are better and 34.3% participants stated CAD/CAM fabricated crowns as good as those fabricated by conventional technique.

According to the present study, about 90.5% of the participants are willing to install the CAD/CAM system in their practices, which is far better than the study conducted by

UK dentists Tran D *et al.* (2016) [5] which is only 52.2%. This suggests that presently the dentists are very much attracted towards newly advanced technology and their percentage is increasing. According to the cross-sectional study of Gade J *et al.* (2021) [10] conducted in Central India, 94.67% of the participants know about the digital impression in the field of the dentistry. But the present study states that there is slightly decline in the percentage (63.8%). This shows that the knowledge among dentists varies from place to place. In the present study, it can be clearly seen that 73% of the total participants thought that the limitation of CAD/CAM system is high cost equipments and the need for extended training. Similar to the study of Tran D *et al.* (2016) [5] the reason for not implementing CAD/CAM was high cost equipments. About 59.3% participants favour this. The limitation of this study was the small sample size. The study can be done using a large population with different variables in different region of India.

Recommendations

1. As more Dentists are interested to learn CAD/CAM technology, it should be added as a part of curriculum and implemented in clinical practice too.
2. Use of CAD/CAM technology both chair-side and centralized fabrication is highly recommended as it reduces Dentist and patient contact, reduces number of appointments and mainly the chances of cross contamination.

Table 1: Demographic details of study participants (N=178).

| Sr. No. | Demographic Details | Responses | Number (N) | Percentage (%) | Total N (%) |
|---------|---------------------|------------------|------------|----------------|-------------|
| 1 | Age (years) | 25-35 | 152 | 85.3 | 178 (100) |
| | | 35-45 | 25 | 14.1 | |
| | | 45+ | 1 | 0.6 | |
| 2 | Gender | Male | 73 | 41.2 | 178 (100) |
| | | Female | 105 | 58.8 | |
| 3 | Education | BDS | 102 | 57.1 | 178 (100) |
| | | MDS | 76 | 42.9 | |
| | | PhD | 0 | 0 | |
| 4 | Qualification | Govt. Employee | 3 | 1.6 | 178 (100) |
| | | Private Employee | 140 | 78.6 | |
| | | Hospital | 35 | 19.8 | |
| 5 | Address | Urban | 167 | 93.8 | 178(100) |
| | | Rural | 11 | 6.2 | |
| 6 | Income | <5 Lac | 138 | 77.5 | 178(100) |
| | | 5-10 Lac | 35 | 20.6 | |
| | | 10 Lac+ | 5 | 2.8 | |

Table 2: Knowledge-based questions of study participants (N=178). Note: N - number, % - percentage

| Sr. No. | Questions | Responses | N | % | Total N (%) |
|---------|---|-------------------------|-----|------|-------------|
| 1. | In which year CAD/CAM was introduced in dentistry? | 1975 | 13 | 7.5 | 178 (100) |
| | | 1880 | 2 | 1.1 | |
| | | 1985 | 85 | 50 | |
| | | 2000 | 17 | 9.8 | |
| | | Don't know | 55 | 31.6 | |
| 2. | CAD/CAM can be used in which branches of dentistry? | Prosthodontics | 41 | 23 | 178 (100) |
| | | Orthodontics | 3 | 1.7 | |
| | | Endodontics | 2 | 1.1 | |
| | | Pedodontics | 1 | 0.6 | |
| | | All of the above | 131 | 73.6 | |
| 3. | CAD/CAM system may be used in? | In office system | 10 | 5.6 | 178 (100) |
| | | Laboratory based system | 20 | 11.2 | |
| | | Milling centre system | 14 | 7.9 | |
| | | All of the above | 134 | 75.3 | |
| 4. | Application of CAD/CAM system in dentistry? | Crown and bridges | 12 | 6.7 | 178 (100) |

| | | | | | |
|-----|---|--|-----|------|-----------|
| | | Inlay, onlay and veneers | 4 | 2.2 | |
| | | Denture and implant supported restorations | 5 | 2.8 | |
| | | All of the above | 157 | 88.2 | |
| 5. | Materials used in CAD/CAM system are? | Metal free ceramic | 13 | 7.3 | 178 (100) |
| | | Metal with ceramic | 7 | 3.9 | |
| | | Porcelain | 14 | 7.9 | |
| | | All of the above | 144 | 80.9 | |
| 6. | CAD/CAM Process consisting of? | Scanning, designing and milling phase | 144 | 80.9 | 178 (100) |
| | | Only designing and milling phase | 10 | 5.6 | |
| | | Only scanning and designing phase | 16 | 9 | |
| | | None of the above | 8 | 4.5 | |
| 7. | Most commonly used CAD/CAM system? | Solid works | 9 | 5.1 | 178(100) |
| | | Fusion360 | 31 | 17.4 | |
| | | NX CAM | 15 | 8.4 | |
| | | All of the above | 117 | 65.7 | |
| | | None of the above | 6 | 3.4 | |
| 8. | Chair-sided economic reconstruction and aesthetic ceramic system is? | 1 st commercially available CAD/CAM system | 112 | 64 | 178 (100) |
| | | Composite resin system | 34 | 19 | |
| | | Castable glass system | 19 | 10.5 | |
| | | Light cure GIC system | 13 | 6.5 | |
| 9. | Additive manufacturing and rapid prototyping is also known as? | 3-D printing | 45 | 25.1 | 178(100) |
| | | Milling | 6 | 3.4 | |
| | | Stereo lithography | 11 | 5.7 | |
| | | 3-D printing and Stereo lithography | 112 | 63.4 | |
| | | None of the above | 4 | 2.3 | |
| 10. | CAD/CAM system component includes? | CAI (Computer aided inspections) | 8 | 4.5 | 178 (100) |
| | | Computer which plans and calculate body form of restorations | 13 | 7.3 | |
| | | Numerically controlled milling machine | 8 | 4.5 | |
| | | All of the above | 144 | 80.8 | |
| | | None of the above | 5 | 2.8 | |
| 11. | What is PNAM in CAD/CAM system? | Presurgicalnasalveolarmolding | 104 | 59.2 | 178 (100) |
| | | Early management of cleft babies | 10 | 5.2 | |
| | | Routine procedure in treatment of bilateral clefts | 10 | 5.2 | |
| | | All of the above | 54 | 30.5 | |
| 12. | What is stereolithographyin CAD/CAM system? | UV curable polymer | 80 | 45.4 | 178 (100) |
| | | Light cure polymer | 11 | 5.7 | |
| | | Both of above | 77 | 43.7 | |
| | | None of the above | 10 | 5.2 | |
| 13. | Major disadvantage of CAD/CAM system is? | Need for extended training | 11 | 5.7 | 178 (100) |
| | | High cost equipments | 26 | 14.4 | |
| | | All of the above | 126 | 73 | |
| | | None of the above | 13 | 6.9 | |
| 14. | How much time it takes to complete the whole process of CAD/CAM system? | 3-4 hrs. | 46 | 25.9 | 178 (100) |
| | | 45 min-2 hrs. | 92 | 52.3 | |
| | | 1 day | 34 | 19 | |
| | | 2 days | 6 | 29 | |
| 15. | Most commonly used material in CAD/CAM system for crown preparations? | Zirconia | 42 | 24 | 178 (100) |
| | | Ceramic | 21 | 12 | |
| | | All of the above | 110 | 62 | |
| | | None of the above | 5 | 2 | |

Table 3: Attitude and practice-based questions of study participants (N=178). Note: N - number, % - percentage.

| Sr. No. | Questions | Responses | N | % | Total N (%) |
|---------|---|-------------------|-----|------|-------------|
| 1. | Do you think CAD/CAM can only be performed by experts only? | Strongly agree | 52 | 29.1 | 178 (100) |
| | | Agree | 78 | 44.4 | |
| | | Neutral | 30 | 16.2 | |
| | | Disagree | 14 | 8 | |
| | | Strongly disagree | 4 | 2.3 | |
| 2. | Do you think CAD/CAM system reduces dental work loads? | Strongly agree | 55 | 30.3 | 178 (100) |
| | | Agree | 100 | 57.1 | |
| | | Neutral | 20 | 10.9 | |
| | | Disagree | 1 | 0.6 | |
| 3. | Do you think CAD/CAM system should be implemented as it reduces the dentist and patients contact? | Strongly disagree | 2 | 1.1 | 178 (100) |
| | | Strongly agree | 48 | 26.9 | |
| | | Agree | 93 | 52.6 | |
| | | Neutral | 32 | 17.7 | |

| | | | | | |
|-----|--|-----------------------------|-----|------|-----------|
| | | Disagree | 2 | 1.1 | |
| | | Strongly disagree | 3 | 1.7 | |
| 4. | Is cost of CAD/CAM system procedure affordable to patients? | Strongly agree | 18 | 10.3 | 178 (100) |
| | | Agree | 21 | 12.1 | |
| | | Neutral | 57 | 32.2 | |
| | | Disagree | 50 | 28.2 | |
| | | Strongly disagree | 32 | 17.2 | |
| 5. | Does use of CAD/CAM reduces patients visit time and multiple appointment? | Strongly agree | 38 | 21.1 | 178 (100) |
| | | Agree | 85 | 48 | |
| | | Neutral | 49 | 27.4 | |
| | | Disagree | 4 | 2.3 | |
| | | Strongly disagree | 2 | 1.1 | |
| 6. | Do you think CAD/CAM system procedure is painless? | Strongly agree | 34 | 18.9 | 178 (100) |
| | | Agree | 82 | 46.3 | |
| | | Neutral | 58 | 32.6 | |
| | | Disagree | 2 | 1.1 | |
| | | Strongly disagree | 2 | 1.1 | |
| 7. | Do you think CAD/CAM fabricated crown are better than conventional fabricated crown? | Strongly agree | 45 | 24.7 | 178 (100) |
| | | Agree | 73 | 41.4 | |
| | | Neutral | 56 | 31.6 | |
| | | Disagree | 2 | 1.1 | |
| | | Strongly disagree | 2 | 1.1 | |
| 8. | Have you ever used CAD/CAM system in your dental practice? | Yes | 70 | 39.7 | 178 (100) |
| | | No | 100 | 56.9 | |
| | | Don't want | 8 | 3.4 | |
| 9. | Does your curriculum contain CAD/CAM system in it? | Yes | 49 | 27.6 | 178 (100) |
| | | No | 111 | 63.2 | |
| | | Don't know | 18 | 9.2 | |
| 10. | Are you interested in installing CAD/CAM in practice in future? | Yes | 157 | 90.5 | 178 (100) |
| | | No | 21 | 9.5 | |
| 11. | Do you have sufficient knowledge regarding CAD/CAM system? | Yes | 110 | 61.3 | 178 (100) |
| | | No | 68 | 38.7 | |
| 12. | Are you aware of digital impression in CAD/CAM system? | Yes | 113 | 63.8 | 178 (100) |
| | | No | 44 | 24.7 | |
| | | Don't know | 21 | 11.5 | |
| 13. | In your practice can post and core be done using CAD/CAM? | Always | 23 | 12.6 | 178 (100) |
| | | Often | 65 | 36.8 | |
| | | Rarely | 40 | 22.4 | |
| | | Never | 50 | 28.2 | |
| 14. | Have you ever practiced 3D printing technology? | Always | 20 | 11.4 | 178 (100) |
| | | Often | 38 | 21.1 | |
| | | Rarely | 40 | 22.3 | |
| | | Never | 80 | 45.1 | |
| 15. | Are you facing any difficulty while operating CAD/CAM system? | Always | 28 | 15.5 | 178 (100) |
| | | Often | 31 | 17.2 | |
| | | Rarely | 59 | 33.3 | |
| | | Never | 60 | 33.9 | |
| 16. | Where have you undertaken your CAD/CAM system training from? | Companies providing CAD/CAM | 18 | 8.9 | 178 (100) |
| | | Private courses | 32 | 17.1 | |
| | | Self-taught | 64 | 37 | |
| | | Other | 64 | 37 | |

Conclusion

The majority of study participants were in the favour that CAD/CAM fabricated restorations are much better than those conventionally fabricated restorations. But they have insufficient clinical knowledge and practice regarding CAD/CAM technology.

References

- Nassani MZ, Ibraheem S, Shamsy E, Darwish M, Farden A, Kujan O. A survey of dentist's perception of chair-sided CAD/CAM technology. *Healthcare*. 2021;9(68):1-9.
- Malthar M, Milos L, Milardovie S, Kovacic I, Persic S, Juros I, Kranjeic. Attitude of students from the school of dental medicine in Zagreb towards CAD/CAM.

- Actastomatolcroat. 2018;52(4);322-29.
- Jain R, Takkar R, Jain GC, Takkar RK, Deora N. CAD/CAM the future of digital dentistry: A review. *Annals of Prosthodontics and Restorative Dentistry*. 2016;2(2):33-6.
- Samra ABP, Morais E, Mazur RF, Vieira SR, Rached RN. CAD/CAM in dentistry - A critical review. *Rey odontocencia*. 2016;31(3):140-44.
- Tran D, Nesbit M, Petridis H. Survey of UK dentists regarding the use of CAD/CAM technology. *British Dental Journal*. 2016;221:639-44.
- Palanisamy S, Hedge C. Awareness among dental undergraduate students regarding CAD/CAM technology - A survey report. *J Health allied sci NIJ*. 2019; 9(57):57-63.

7. Sriram S, Vidhyashankari, Yohan C. Computer aided designing/Computer aided manufacturing in dentistry (CAD/CAM) - A review. *International Journal of Current Research and Review*. 2018;5:385-89.
8. Susci I, Travar M, Susci M. The applications of CAD/CAM technology in dentistry. *IOP Conference Series: Material Science and Engineering*. 2017; 012020.
9. Al Rashdi AK, Al Mutairi FM, Al dubaikhi AH, Zaylaee LY, Al harbi AD, Messa HM. Dental CAD/CAM: A brief review. *International Journal of Medicine in Developing Countries*. 2020;4(11):1975-79.
10. Gade J, Agrawal M, Jaswal K, Agarkar A, Ingole A, Dandekar S. Knowledge and awareness amongst dental undergraduate students regarding CAD/CAM technology in central India: A cross-sectional survey. *Journal of Research in Medical and Dental Science*. 2021;9(10):8-11.