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Various Method Of Tooth Carving - Modern 3d Carving And Recent Advance In Carving - A Kap Survey

Swetha K , Dr. Sindhuja , Dr. Lakshmi

1 Saveetha Dental College
Saveetha Institute of Medical and Technical Sciences
Saveetha University, Chennai
Email :shwethakrish1801@gmail.com

2 Senior lecturer,
Department of Pathology,
Saveetha Dental College,
Saveetha Institute of Medical and Technical Sciences,
Chennai-77
Tamil Nadu, India
Email: sindujap.sdc@saveetha.com

3 Senior Lecturer,
Department of Oral Pathology and Microbiology ,
Saveetha Dental College,
Saveetha Institute of Medical and Technical Sciences,
Chennai-77
Tamil Nadu, India
Email: lakshmita.sdc@saveetha.com

ABSTRACT
Introduction
Dental anatomy is foundational to the study of dentistry. Therefore, good knowledge of gross anatomy is paramount in clinical practice to revive the aesthetics of the smile, the professional must possess technical knowledge domain about the present composites, artistic sense, dexterity, and manual ability Without this data , it's impossible to practice dentistry, which aids in restoring damaged or lost teeth and dental function.

Aim of the study
The aim of the study is to evaluate the various methods of tooth carving and recent advanced technique and carving.

Materials and methods
The sample size used for the study is 100. A self structured questionnaire was prepared and uploaded in Google forms.This standard questionnaire in Google forms was circulated among the sample study population and at the end of the survey, all the data was collected and was analysed by using Chi square analysis.The chi square analysis was done using the software IBM SPSS Version 2.3. The p value was set at p<0.05.

Result

With 47.57 percent of study subjects responding to crown being the most interesting portion of tooth carving, 24.27 percent of research subjects responding to the root, 23.30 percent of research subjects responding to both crown and root, and 4.85 percent of research subjects responding maybe, the crown received the most attention.

Conclusion
This present study has concluded that the majority of females are more interested in tooth carving than males and 47.57 percent of study subjects responding to the crown which has more responses.

KEYWORDS
Tooth carving, 3D modelling, innovative technique, novel method

INTRODUCTION

Dental anatomy is foundational to the study of dentistry. Therefore, good knowledge of gross anatomy is paramount in clinical practice to revive the aesthetics of the smile, the professional must possess technical knowledge domain about the present composites, artistic sense, dexterity, and manual ability(1) Without this data , it's impossible to practice dentistry, which aids in restoring damaged or lost teeth and dental function. To revive the dental function, it is necessary that the anatomical shape of reconstructed teeth is correct.(2). Methods for the assessment of psychomotor skills in preclinical restorative dentistry, like wax carving, computer animated graphics, 3D images, digital atlases, and photorealistic 3D models of human teeth are wont to correlate manual dexterity successfully in dental schools(3).Students within the current era because they're more tech-savvy and exposed to the newest gadgets will have a more efficient and enjoyable E-learning experience.

These computer-based methods provide excellent visualization, help in assimilation and re-memorization of anatomical knowledge using virtual anatomy, and facilitate effective integration of spatial and symbolic domains. (4). Carving has been advocated for developing cognitive and motor skills(5). The choice of the tactic to show gross anatomy is based on several reasons , and it should consider the available budget, student/professor ratio, curriculum and desired professional profile(6) . Due to the high student/teacher ratio, within the School of Dentistry of the Federal University a geometrical method using models was thought as being suitable.(7) The Three-stages Sculpture Geometric Technique (TST) has been applied in an effort to provide conditions under which the scholar can acquire gross anatomy knowledge when still in the second semester.(8). The efficacy of courses that integrate traditional teaching with the utilization of online resources has been widely debated, despite increasing use. During this model of learning, interactivity is claimed to be mandatory.(9) Distance Learning (DL) at UFMS uses the online environment Moodle(10). 3D printing may be a rapid prototyping technology that's based on digital model files(11) and uses powdery adhesive materials to construct 3D objects through layer-by-layer printing.(12) 3D printing is implemented by a digital printer and is widely utilized in industrial design, architecture, engineering and construction, automotive design,aerospace engineering and other fields.(13). Dental anatomy may be a basic subject of dental education, one among the foundation courses within the preclinical dental curriculum. This subject, taught within the preclinical years, teaches information that students will later use routinely in their practice .(14). In most dental schools , teaching dental anatomy may be a two fold process.(15) Students first observe natural teeth, analyze drawings and study textbooks. Next, students carve various materials (wax, plaster or plastic) to breed a given reference model of teeth in various sizes. Our team has extensive knowledge and research experience that has translated into high quality publications .

(16),(17),(18),(19),(20),(21),(22),(23),(24),(25),(26),(27),(28),(29),(30),(31),(32),(33),(34),(35). The aim of the study is to evaluate the various methods of tooth carving and recent advanced technique and carving.

MATERIALS AND METHODS

A cross-sectional study was done using google docs. A self-structured questionnaire containing 17 questions was prepared and approved by SRB of Saveetha Dental College and Hospitals. The link was shared to 100 Undergraduate dental students, and the results were analysed using SPSS version 2.3 and Chi square test was done and statistical significance was set at $P < 0.05$ and represented in the form of a pie chart using descriptive statistics. Minimizing errors, framing questions in simple language and avoiding leading questions were some of the measures taken to minimize bias.

Questionnaire compiled in a series of questions including demographic their demographic characteristics age and gender.The other questions are as follows:
1. Did you carve teeth during your undergraduate dental study?
2. Did you like tooth carving?
3. Did you carve a complete set of teeth?
4. Which part of tooth anatomy is important for your clinical practice?
5. Is the total time allotted for tooth carving in UG dental syllabus relevant?
6. Do you think the knowledge of tooth carving is more important for dental technicians rather than dental graduates?
7. Has carving influenced your knowledge of tooth anatomy?
8. Does tooth carving helpful in restorative dentistry?
9. Does tooth carving help in understanding dental occlusion?
10. Has carving influenced your clinical skills?
11. Do you think carving should be continued in undergraduate dental syllabus?
12. Should carving be removed as an assessment parameter in end-yearly exams ?
13. Do you think practicing carving on extracted teeth and manikin models would be enough?
14. Do you think computer software with image simulation techniques will help in learning tooth anatomy better?
15. Have you ever seen videos for 3D modelling of tooth carving?
16. What do you think about 3D modelling of tooth carving?
17. Have you ever practiced recent advanced techniques of tooth carving ?

RESULT

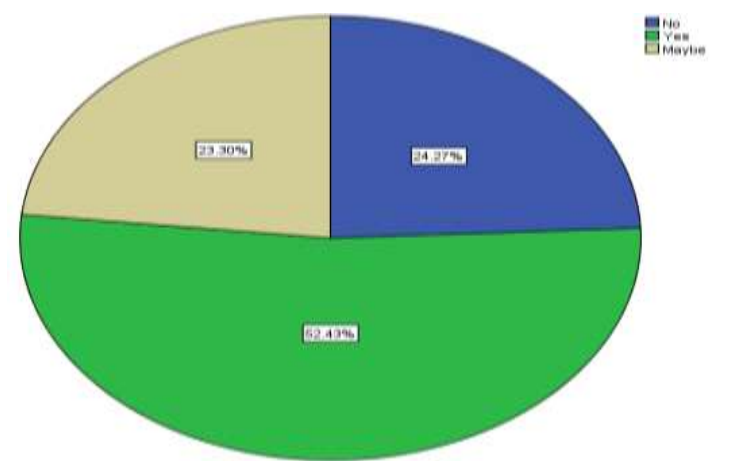Figure 1: Did you carve teeth during your undergraduate dental study?

Figure 1 shows the response to the question as to whether tooth carving was included for undergraduate dental study. Blue, green, light brown represents No, Yes and Maybe respectively . Most of the study subjects responded Yes with 52.43% and 24.27% of study subjects responded 'No' and 23.30% of study subjects responded ' Maybe '. Majority of the participants carved teeth during their UG.
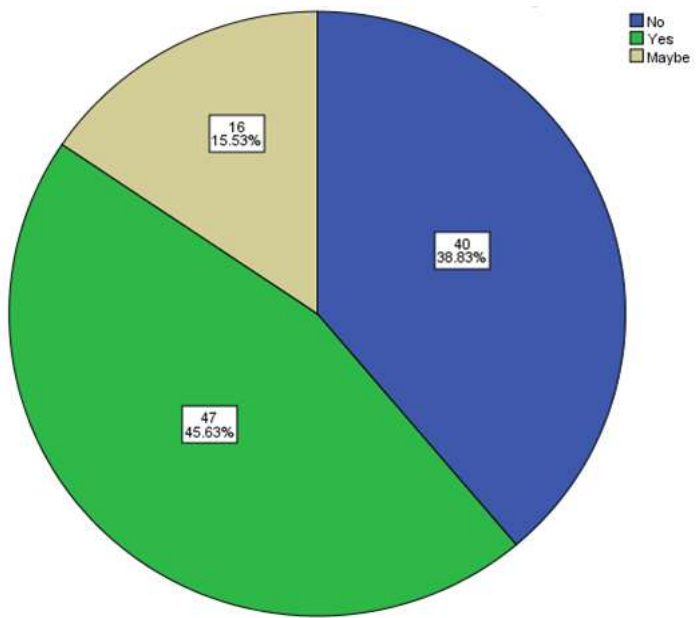
Figure 2: Did you like tooth carving?

Figure 2 shows the response of students that liked tooth carving. Blue, green, light brown represents Yes, No and Maybe respectively . Most of the study subjects responded Yes with 45.63% and 38.83% of study subjects responded 'No' and 15.53% of study subjects responded ' Maybe '.Majority of them like tooth caving.

Figure 3:Which part of tooth anatomy is important for your clinical practice?
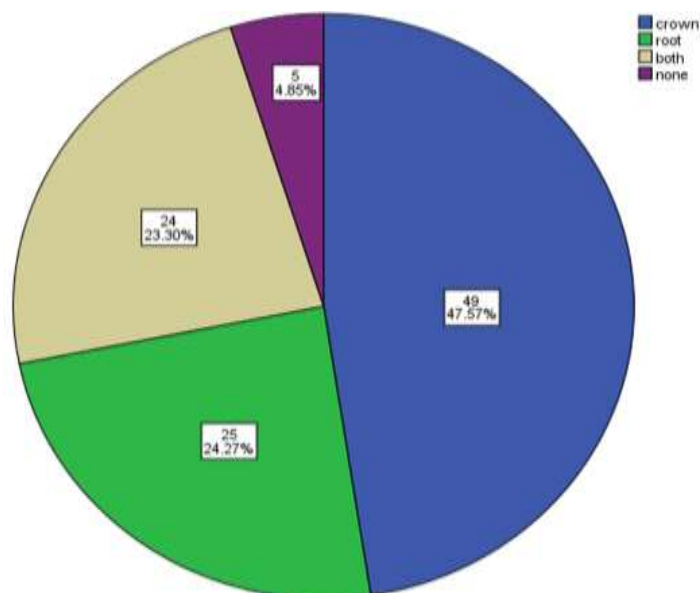
Figure 3 shows the response of the important parts of tooth anatomy for clinical practice . Blue, green, light brown and purple represent crown, root, both and none respectively . Most of the study subjects responded to the crown with 47.57% and 24.27% of study subjects .responded to root and 23.30% of study subjects responded to both crown and root and 4.85% of the study subjects responded maybe. Majority of them answered that crown is their important part of tooth anatomy.

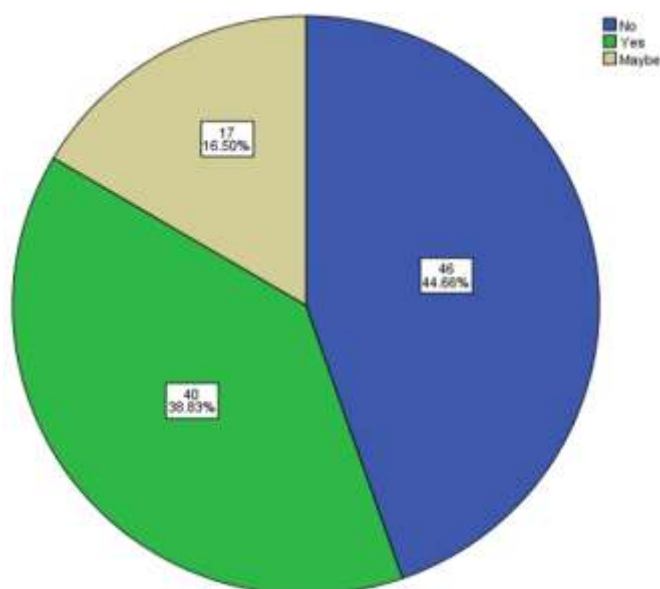Figure 4: Has carving influenced your knowledge of tooth anatomy?

Figure 4 shows the response of knowledge of tooth anatomy that carving influenced. Blue, green, light brown and purple represent crown, root, both and none respectively . Most of the study subjects responded to the crown with 47.57% and 24.27% of study subjects responded to root and 23.30% of study subjects responded to both crown and root and 4.85% of the study subjects responded maybe.For majority of them tooth carving influenced their knowledge.

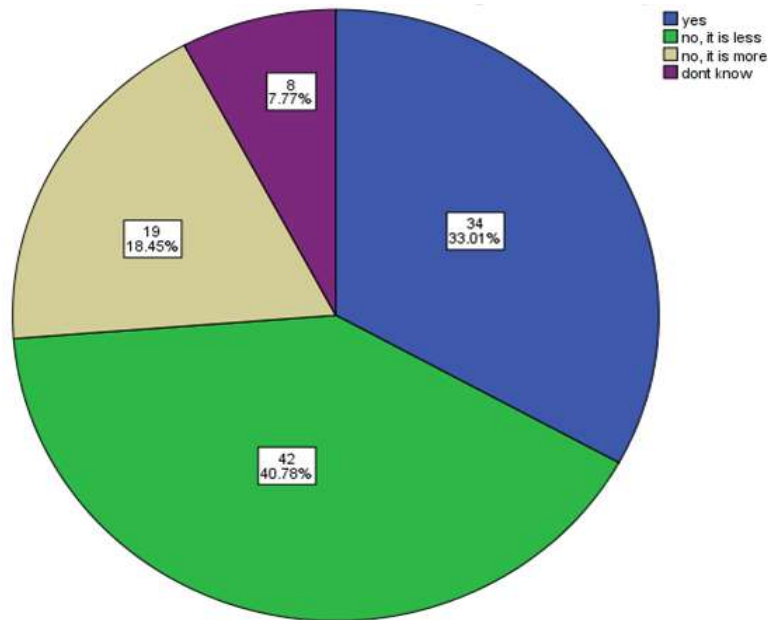Figure 5: Is the total time allotted for tooth carving in UG dental syllabus relevant?

Figure 5 shows the response of total time allotted for tooth carving in UG dental syllabus relevant. Blue, green, light brown and purple represent yes, no, it is less, no, it is more and don't know respectively . Most of the study subjects responded to the 'no,it is less' with 40.78% and 33.01% of study subjects responded to 'yes' and 18.45% of study subjects responded to 'no, it is more' and 7.77% of the study subjects responded to ' don't know'.For majority of them total time allotted for tooth carving in UG dental syllabus is applicable.
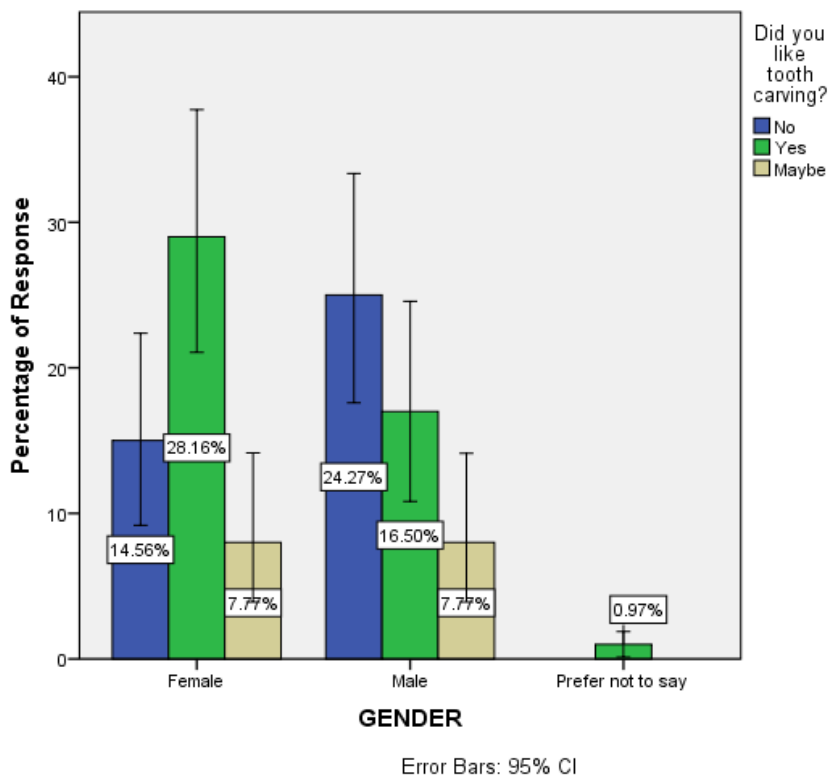
Figure 6: Did you like tooth carving?

Figure 6: The bar graph represents the association between gender and whether participants liked tooth carving. X-axis represents the gender and Y-axis represents the percentage of responses. Blue , green and light brown represent No, yes and maybe respectively. Majority of females liked tooth carving more than male. Chi square test was done and association was found to be statistically not significant (P value is 0.147, P>0.05).

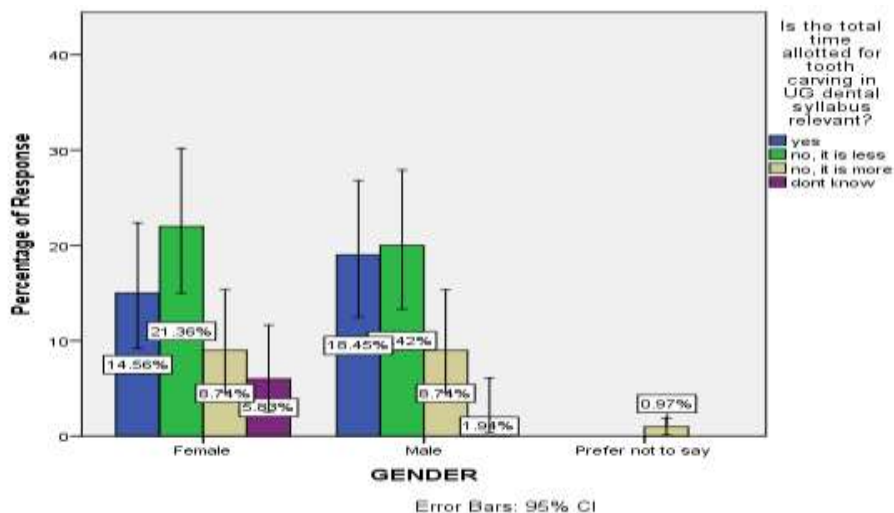Figure 7: Is the total time allotted for tooth carving in UG dental syllabus relevant?

Figure 7: The bar graph represents the association between gender and total time allotted for tooth carving in UG dental syllabus relevant. X-axis represents the gender and Y-axis represents the percentage of responses. Blue represents yes, green represents no it is less, light brown represents no it is more, and purple represents don't know. Majority of females wanted more allotted time for carving than male. Chi square test was done and association was found to be statistically not significant (P value is 0.319, P>0.05).

Figure 8 : Do you think the knowledge of tooth carving is more important for dental technicians rather than dental graduates?
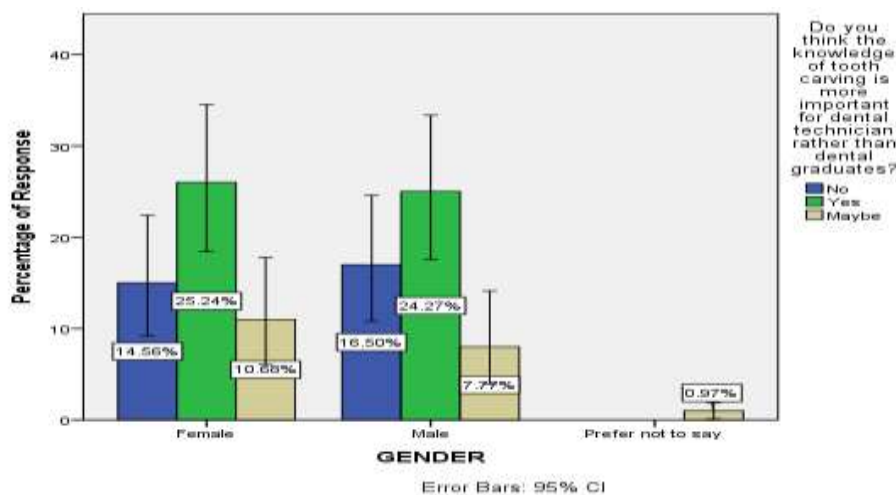

Figure 8: The bar graph represents the association between gender and whether the knowledge of tooth carving is more important for dental technicians rather than dental graduates. X-axis represents the gender and Y-axis represents the percentage of responses. Blue, green, light brown represent No yes and maybe respectively. Majority of females' opted for 'knowledge of tooth carving is more

important for dental technicians rather than dental graduates' than males. Chi square test was done and association was found to be statistically not significant (P value is 0.313, P>0.05).

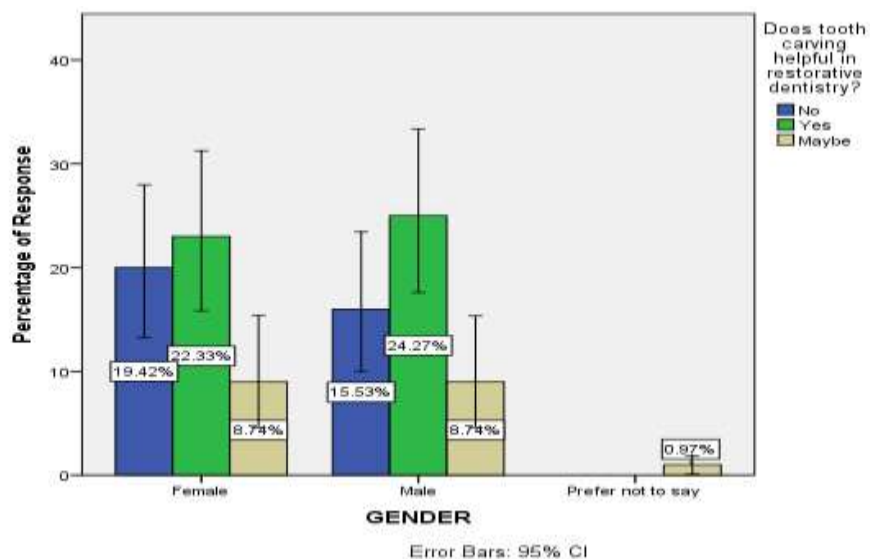Figure 9: Does tooth carving help in restorative dentistry?

Figure 9: The bar graph represents the association between gender and whether tooth carving is helpful in restorative dentistry. X-axis represents the gender and Y-axis represents the percentage of responses. Blue, green, light brown represent No yes and maybe respectively. Majority of females responded that tooth carving helped them in restorative dentistry more than male. Chi square test was done and association was found to be statistically not significant (P value is 0.292, P>0.05).

Figure 10: Which part of tooth anatomy is important for your clinical practice?
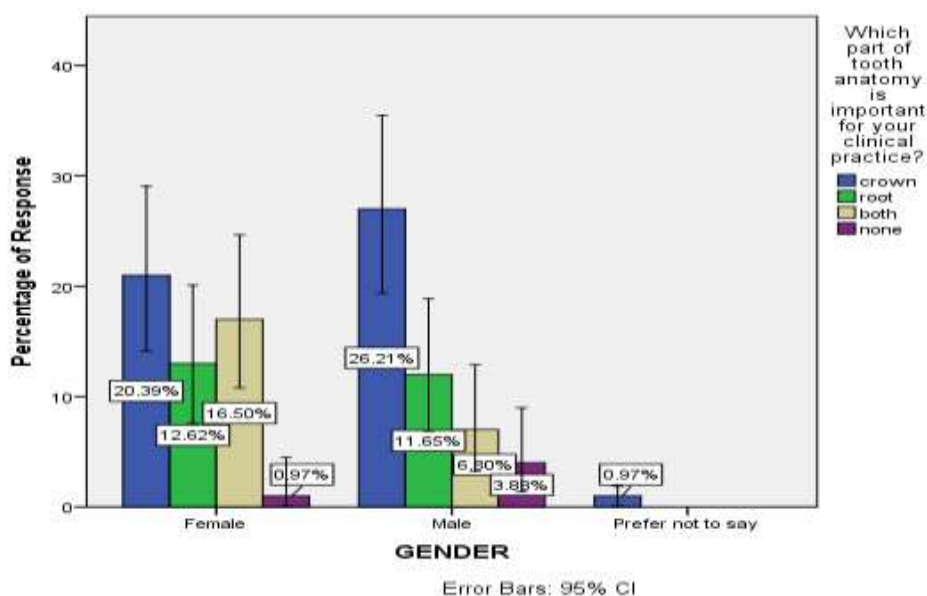

Figure 10: The bar graph represents the association between age and tooth anatomy is important for clinical practice. X-axis represents the gender and Y-axis represents the percentage of responses. Blue, green, light brown and purple represent crown, root, both and none respectively. Majority of them

from the age 18 responded that the crown is important for clinical practice. Chi square test was done and association was found to be statistically not significant (P value is 0.473, P>0.05).

Figure 11: What do you think about 3D modelling of tooth carving?
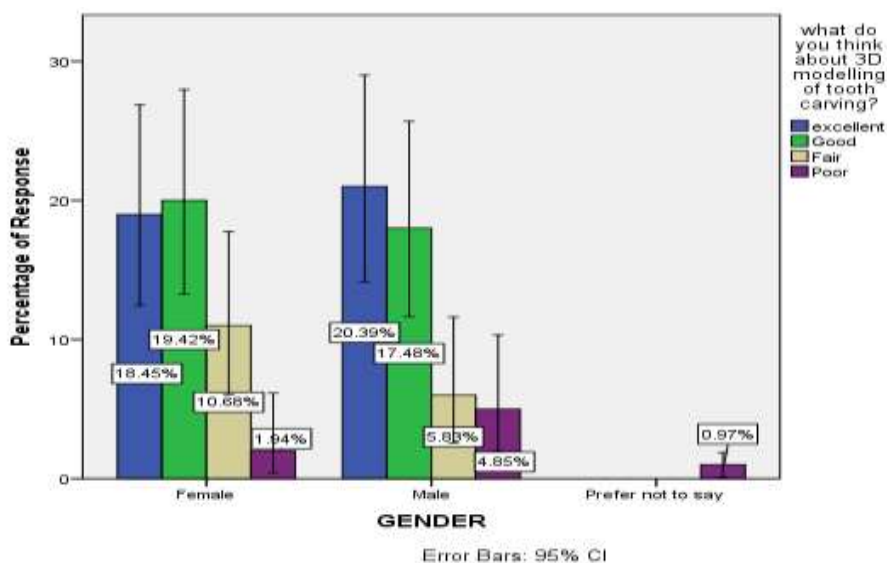

Figure 11: The bar graph represents the association between age and opinion about 3D modelling of tooth carving. The X-axis represents the gender and Y-axis represents the percentage of responses. Blue, green, light brown and purple represent excellent, good, fair and poor respectively. Majority of them from the age 18 responded that 3D modelling of tooth carving is excellent. Chi square test was done and association was found to be statistically not significant (P value is 0.717,P>0.05).

Figure 1 most of the study subjects responded Yes (52.43%) for whether tooth carving was included for undergraduate dental study. Figure 2 shows students that liked tooth carving most of the study subjects responded Yes (45.63%). Figure 3 shows the response of the important parts of tooth anatomy for clinical practice, most of the study subjects responded to crown (47.57%). Figure 4 shows the response of knowledge of tooth anatomy that carving influenced, most of the study subjects responded to the crown (47.57%). Figure 5 shows the response of total time allotted for tooth carving in UG dental syllabus relevant, most of the study subjects responded to the 'no,it is less' (40.78%)

DISCUSSION

There are nearly two-thirds (63.2%) of respondents believed that total time allotted for tooth carving in UG dental syllabus relevant., and two-thirds (66.6%) felt that there is no total time allotted for tooth carving (36) whereas, in my study explains that total time allotted for tooth carving in UG dental syllabus is applicable. Most of the study subjects responded that there is no total time allotted for tooth carving with 40.78% and 33.01% of study subjects responded to total time allotted for tooth carving and 18.45% of study subjects responded that there is more time allotted for tooth carving and 7.77% of the study subjects responded that they don't know about tooth carving'.

In a prior survey, 98.3 percent of participants said they practised wax tooth carving as part of their college education, but just 50 percent said they enjoyed it. Only 7.3% had carved a full sets of both permanent and deciduous teeth, while half (49.1%) had carved only few permanent teeth (37) In my

study, the majority of study subjects responded that they had performed tooth carving with wax in their undergraduate studies (45.63 percent), 38.83 percent of study subjects responded that they didn't have interest in tooth carving with wax in their undergraduate studies, and 15.53 percent of study subjects responded that they might have interest in tooth carving with wax in their undergraduate studies.

Dentists may encounter complicated situations that necessitate the extraction of teeth from the high aesthetic zone. Despite the extensive range of therapeutic options available to save the tooth, in cases of trauma, extensive periodontal disease, root resorption, or failed endodontic therapy, extraction of a single anterior tooth is unavoidable.(38).CAD (Computer-Aided Design)/CAM (Computer-Aided Manufacturing) has been introduced to dentistry and has achieved great success in clinical applications such as orthodontics, oral and maxillofacial surgery, and CAD (Computer-Aided Design)/CAM (Computer-Aided Manufacturing) has been introduced to dentistry and has achieved great success in clinical applications such as orthodontics, oral and maxillofacial surgery.(39)

CONCLUSION

This present study has concluded that the females are more interested in tooth carving than males. More than 90% of the scholars thought that the 3D-printed plastic model teeth were of great help or were very helpful in mastering the anatomy of teeth and in carving the gypsum teeth.According to this study, clinically relevant learning enhances conceptual knowledge and psychomotor capabilities. The majority of responders thought this exercise was a useful way to learn about tooth anatomy. The majority of the participants in the survey believe that carving assisted them in restorative dentistry.

LIMITATIONS:

The study data are self-reported and thus are subject to social desirability biases. Our study was based on small sample size, these limitations will be solved in future studies.

FUTURE SCOPE:

Due to less time , only less sample size was taken to this study. In future more sample sizes will be included.

- Saveetha University
- Indian optics & contact lens centre.

AUTHOR CONTRIBUTION

Swetha K : Literature search, data collection analysis, manuscript drafting.
Dr Sindhuja : Aided in conception of the topic, has participated in the study design, statistical analysis and has supervised the preparation and final corrections of the manuscript.
Dr Lakshmi : Data verification, manuscript drafting, preparation of the manuscript.

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