

Overview On Permanent Tooth - A Cross Sectional Survey Among Ug Dental Students

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ABSTRACT :

Background - Human jaw consists of 32 teeth namely incisors, canine, premolars and molars. The first permanent tooth to erupt is the maxillary first molar at 6-7 years and the last is the third molar around 22-23 years. Each tooth is unique with its own morphology, calcification, eruption.

Aim - To assess the knowledge about permanent teeth among first year dental students. **Materials and methods**- The online survey was conducted among first year dental students of a private dental college. The questionnaires were circulated using google forms. The data obtained are tabulated and statistically analysed through spss software (version 23).

Results - In our study, 96% of them were aware about calcification of the maxillary and mandibular first molars. In our study, males (52%) have more knowledge about permanent teeth when compared to females(48%) The association between the gender and percentage of response for permanent tooth eruption gives a p-value of 0.521(p value > 0.05) in pearson chi square test and hence it is statistically not significant.

Conclusion- This study concluded that first year students have adequate knowledge on calcification, eruption and morphology of permanent teeth. However, males answered many questions correctly when compared to female students.

Key words : Permanent tooth, calcification, eruption, roots, novel method

INTRODUCTION

Human jaw consists of 2 parts, maxillary referring to the upper jaw and mandibular that is the lower jaw. The maxillary is divided into 2 quadrants called the upper left quadrant and upper right quadrant called upper left quadrant, the mandibular divides into the lower left quadrant and lower right quadrant (1). Adult jaw has 32 teeth and 4 types of teeth: incisor, canine, premolar, molar. Each tooth has a mesial, distal, labial and palatal (maxilla) and lingual (mandible) surface. The anterior teeth have incisal and posterior teeth have occlusal surface(1,2). The crown and root join at a surface is called cemento-enamel junction (1).

Maxillary molar calcification period is at birth and its crown development period is 3 to 4 years and complete root formation 9 to 11 years. Mandibular molar evidence of calcification is at birth and enamel complete formation is 2 ½ to 3 years and root complete formation is 9 to 12 years. Maxillary canine first evidence of calcification is at 4 to 5 months and enamel completion is 6 to 7 years and root complete formation is 13 to 14 years. Central incisors evidence of calcification is 3 to 4 months and complete formation of enamel is 4 to 5 years and complete root formation is at 10 years. Premolars first evidence of calcification is 1 ½ to 2 years and complete root formation is 12 to 13 years and complete formation of enamel is at 7 years.

Complete eruption period of the mandibular first molar is 6 to 7 years. Complete eruption period of the maxillary central incisors is 7 to 8 years. Complete eruption period of the maxillary molars is 6 to 8 years. All permanent teeth complete eruption by the age of 22. Incisors are helpful in shearing or cutting and posteriors for mastication (3). Maxillary molars have three roots (two buccal and one palatal) and mandibular molars have two roots namely mesial and distal (4). It is necessary for the students to know about the morphology, eruption and calcification of teeth for the proper diagnosis and treatment. Our team has extensive knowledge and research experience that has translated into high quality publications (12-31). Thus, the aim of the study was to assess the knowledge about permanent teeth among first year dental students.

MATERIALS AND METHODS

This is a cross sectional and questionnaire based survey to assess the knowledge on permanent teeth among first year dental students. Survey includes questions on tooth anatomy, development and associated nomenclature and numbering system of the permanent tooth. The survey was conducted

online with 100 students. Online based survey was conducted with the help of "Google forms". Method of sampling is simple random sampling. The responses were collected, tabulated in the excel sheet and analysed . Data entered in spss version 23 and result is represented in the bar graph and pie charts. Chi square test was used to analyze and comparative bar graphs were plotted and it is statistically significant only if the p value is less than 0.05

Questionnaire

Serial number	Questions	Options
1	Permanent tooth eruption is the process of tooth development which occur over a approximate	7 year period , 10 year period, 21 year period,25 year period
2	Which set of teeth classify first	Maxillary and mandibular first molar,maxillary and mandibular second molar , maxillary and mandibular canine, maxillary and mandibular incisors
3	Which is the smallest cusp in mandibular first molar	Lingual cusp , distal buccaneers cusp ,palatal cusp , occlusal cusp
4	How many cusp does mandibular first molar have	2,3,4,5
5	Which tooth has the longest root	Incisor ,canine,pre molar, molar
6	Which tooth has cusp of carabelli	Maxillary first molar,maxillary canine,maxillary second molar, maxillary pre molar
7	When is the lower second pre molar erupts	10to 12 year , 13 to 17 year, 18-20 year, 7 to 10 year
8	When does lower third molar erupts	10 to 12 years , 13 - 17 years, 18 to 20 years, 7 to 10 years
9	When does eruption takes place in canine	11- 12 years, 13- 14 years,6-7 years,8- 11 years
10	When does enamel complete in mandibular central incisor	9 years, 6-7 years,3-4 years, 1-2 years

RESULTS:

In this study, 52% were male and 48% were female participants (**Figure 1**). In our study 4% of the participants were aware about the chronological eruption of permanent teeth (**Figure 2**). Among the participants, 96% of them were aware about calcification of the maxillary and mandibular first molars (**Figure 3**). Only 1% of the participants were aware about the smallest cusp in the mandibular first molar (**Figure 4**). In our study, 95% of the participants were aware that the tooth with the longest root is canine (**Figure 5**). In our study, 83% of the participants were aware about the cusp of carabelli (**Figure 6**). In our study, 47% of the participants were aware about the second molar eruption period (**Figure 7**) and 13% of the participants were aware about the lower third molar eruption period (**Figure 8**). Only 18% of the participants were aware about the canine eruption period (**Figure 9**). The association between the gender and response for the complete eruption of mandibular central incisor and the p value is 0.283 (p value > 0.05), hence it is statistically not significant (**Figure 10**). The association between gender and response for the permanent tooth development yields a p value of 0.521 (p value > 0.05) and hence it is statistically not significant (**Figure 11**). The association between gender and response for the first set of tooth to calcify and the p value is 0.544 (p value > 0.05) hence it is statistically not significant (**Figure 12**).

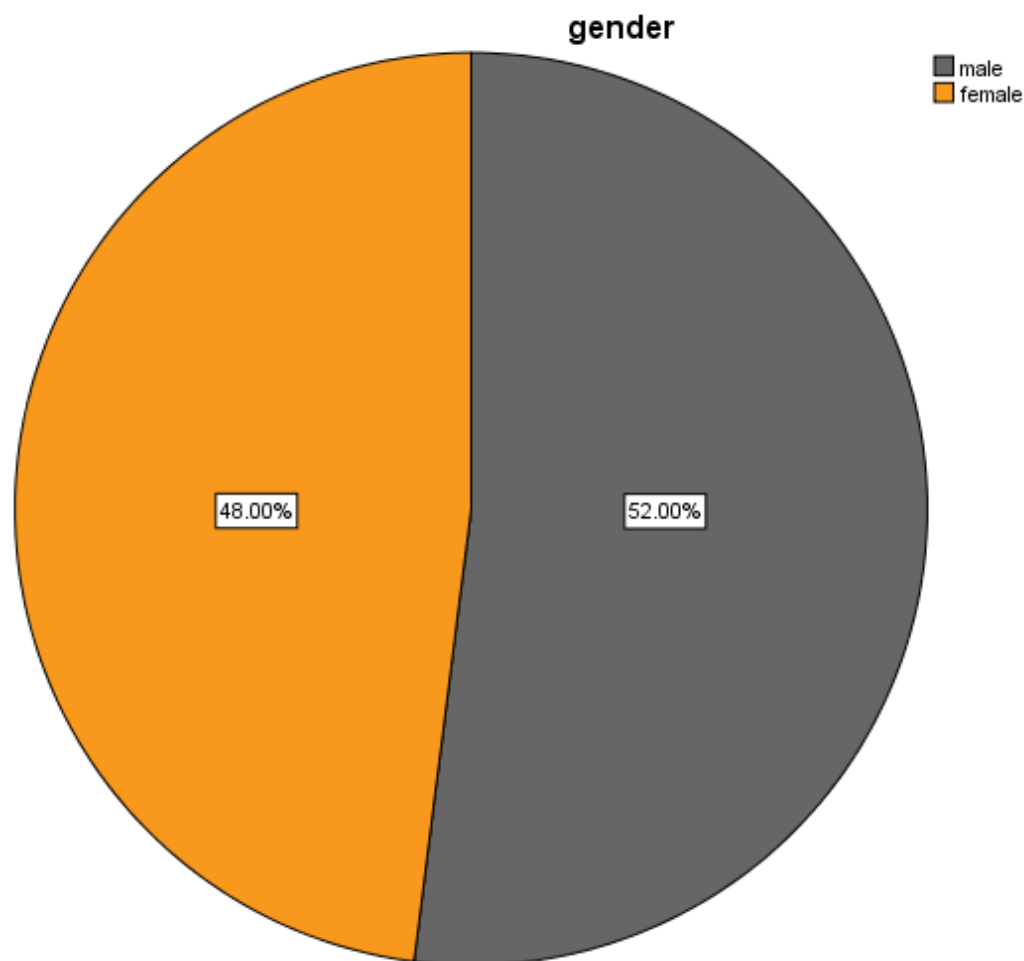


Fig1: The pie chart shows the percentage of responses of the number of male and female participants. orange indicates female population and grey indicates male population .Majority (52%) were male and 48% were female.

Permeant tooth eruption is the process of tooth development which occurs over a approximate

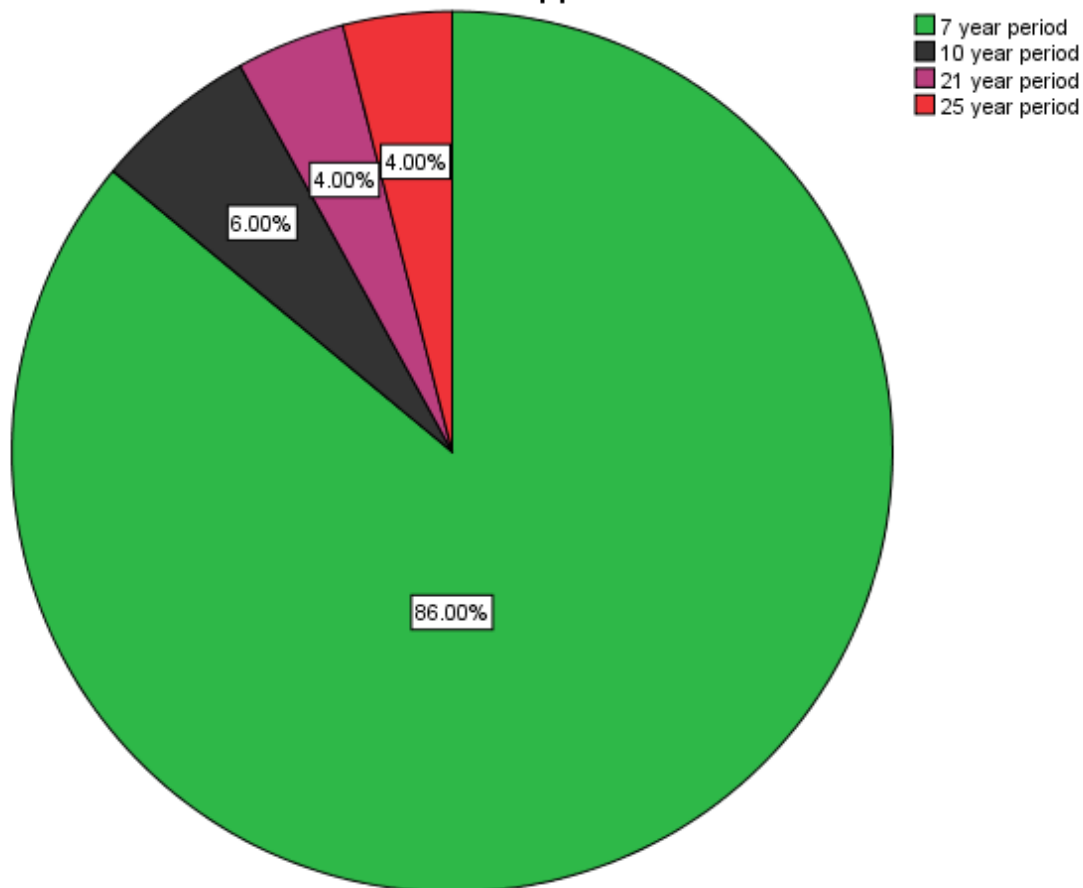


Fig 2: The pie chart shows responses for the overall period of the permanent tooth eruption. Green represents a 7 year period, Brown represents 10 years. Pink represents 21 years. light Red represents 25 years. (86%) participants have chosen the 7 year period, (6%) participants have chosen the 10 year period, (4%) participants have chosen the 21 year period, (4%) participants have chosen the 25 year period. green represents 7 years. Only (4%) of participants were aware whereas were unaware about the overall period of permanent tooth eruption.

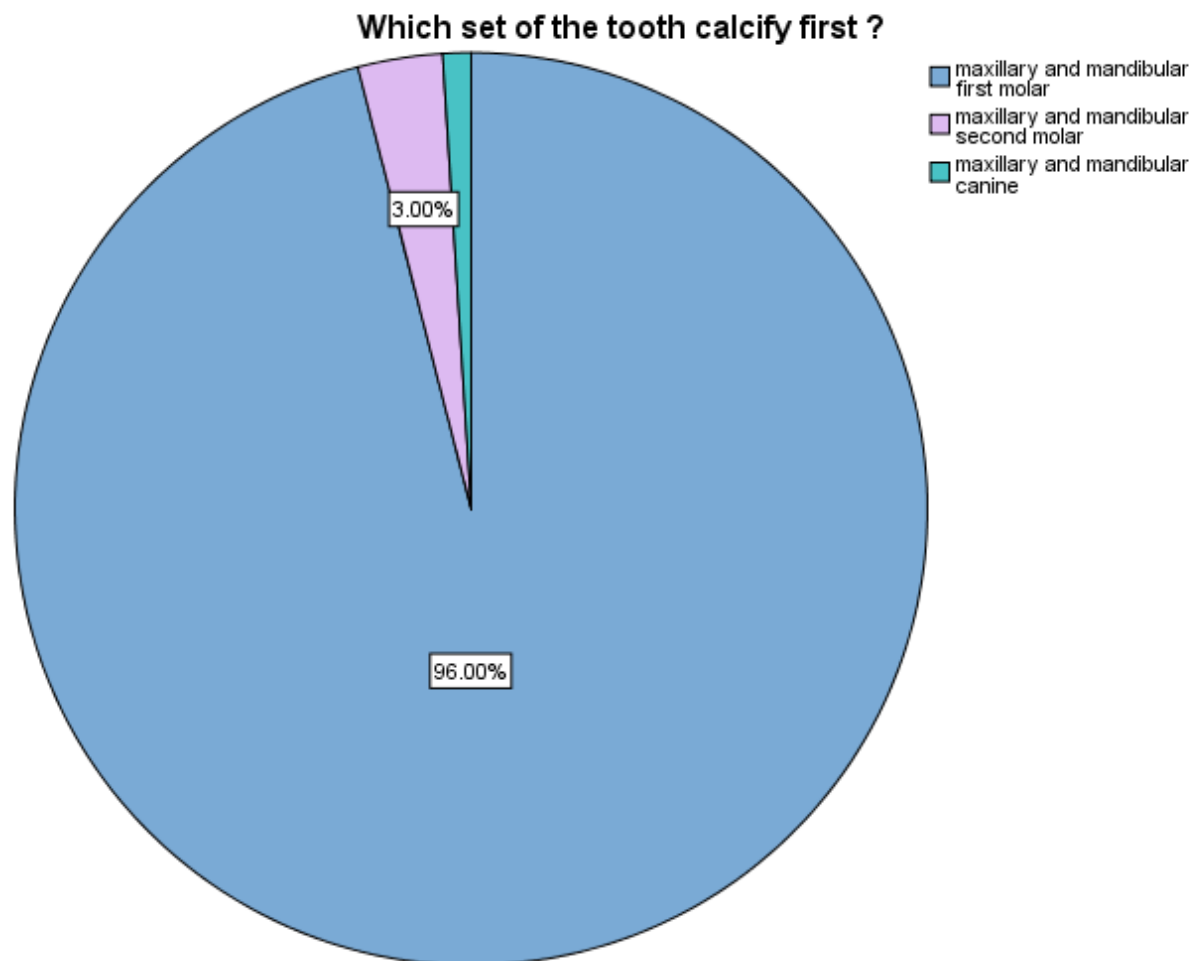


Fig 3: The pie chart shows the responses for the tooth that calcifies first. Majority (96%) participants chose maxillary and mandibular first molar, Purple represents maxillary and mandibular second molar. Turquoise represents maxillary and mandibular canine,(3%)participants chose maxillary and mandibular second molar, (1%)participants chose maxillary and mandibular canine.

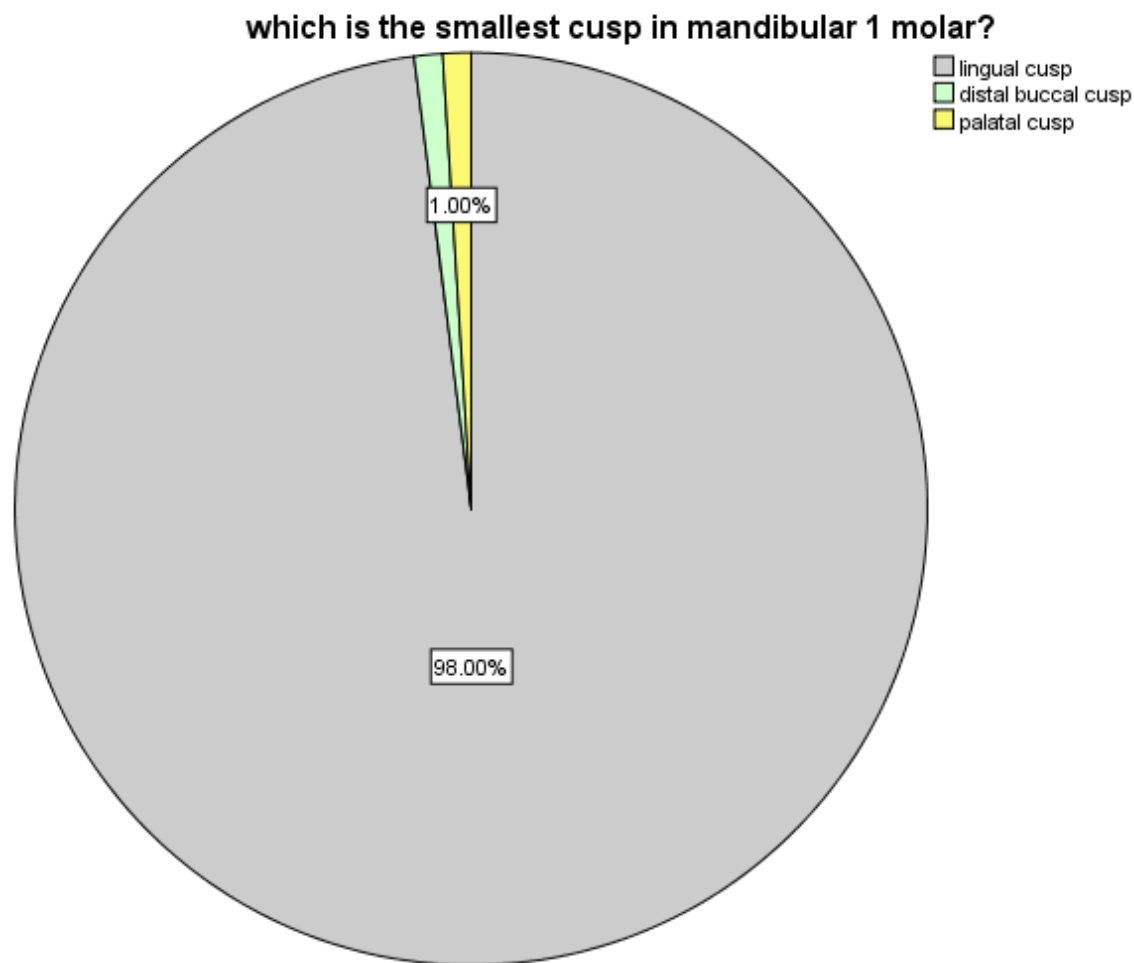


Fig 4: The pie chart shows the responses of the smallest cusp in the mandibular first molar. Neon Green represents distal buccal cusp. Light Yellow represents palatal cusp. majority of the responses (98%) of the participants have chosen lingual cusp, (1%) of the participants have chosen distal buccal cusp , (1%)of the participants have chosen palatal cusp.

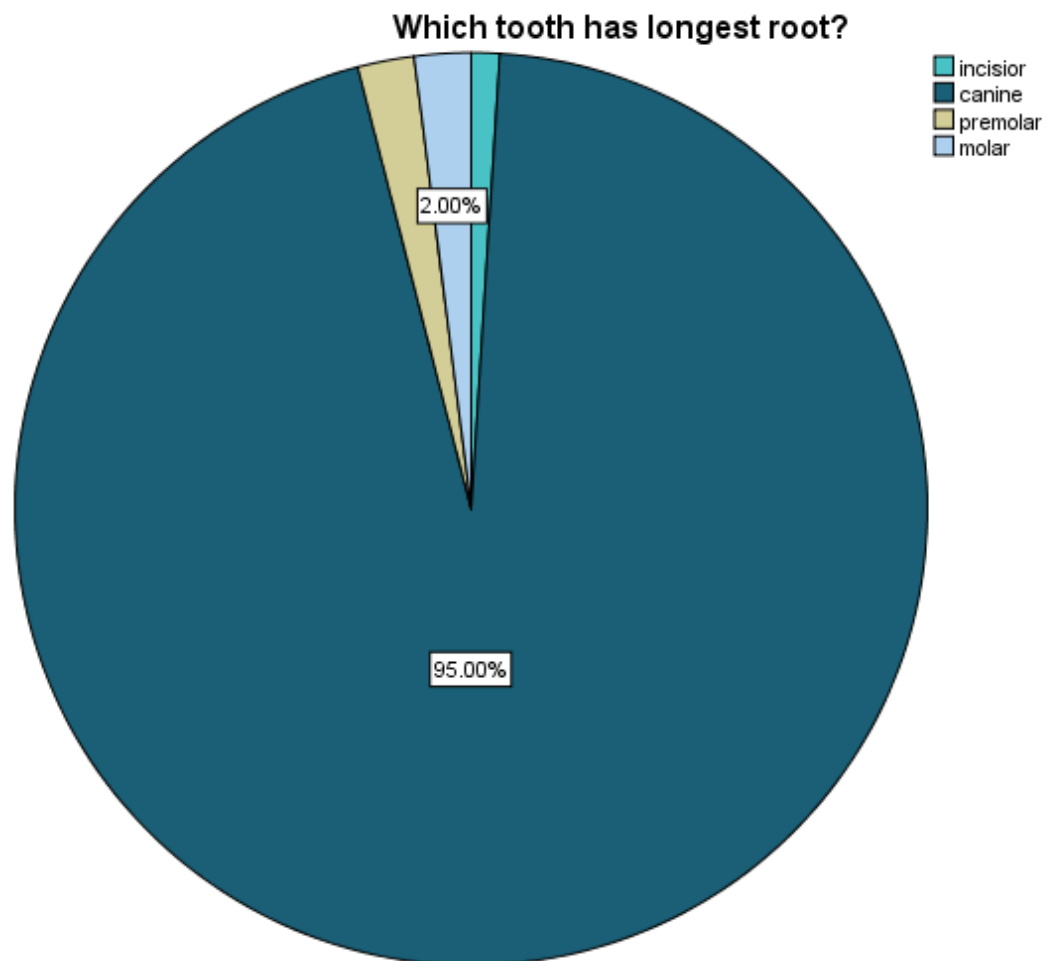


Fig 5: The pie chart shows the responses of the longest root in the permanent tooth. Light blue represents molars, turquoise green represents canine, yellow represents premolar, light blue represents molar. Majority of the participants (95%) chose canine, (2%) chose molar, (2%) chose premolar and (1%) chose incisor.

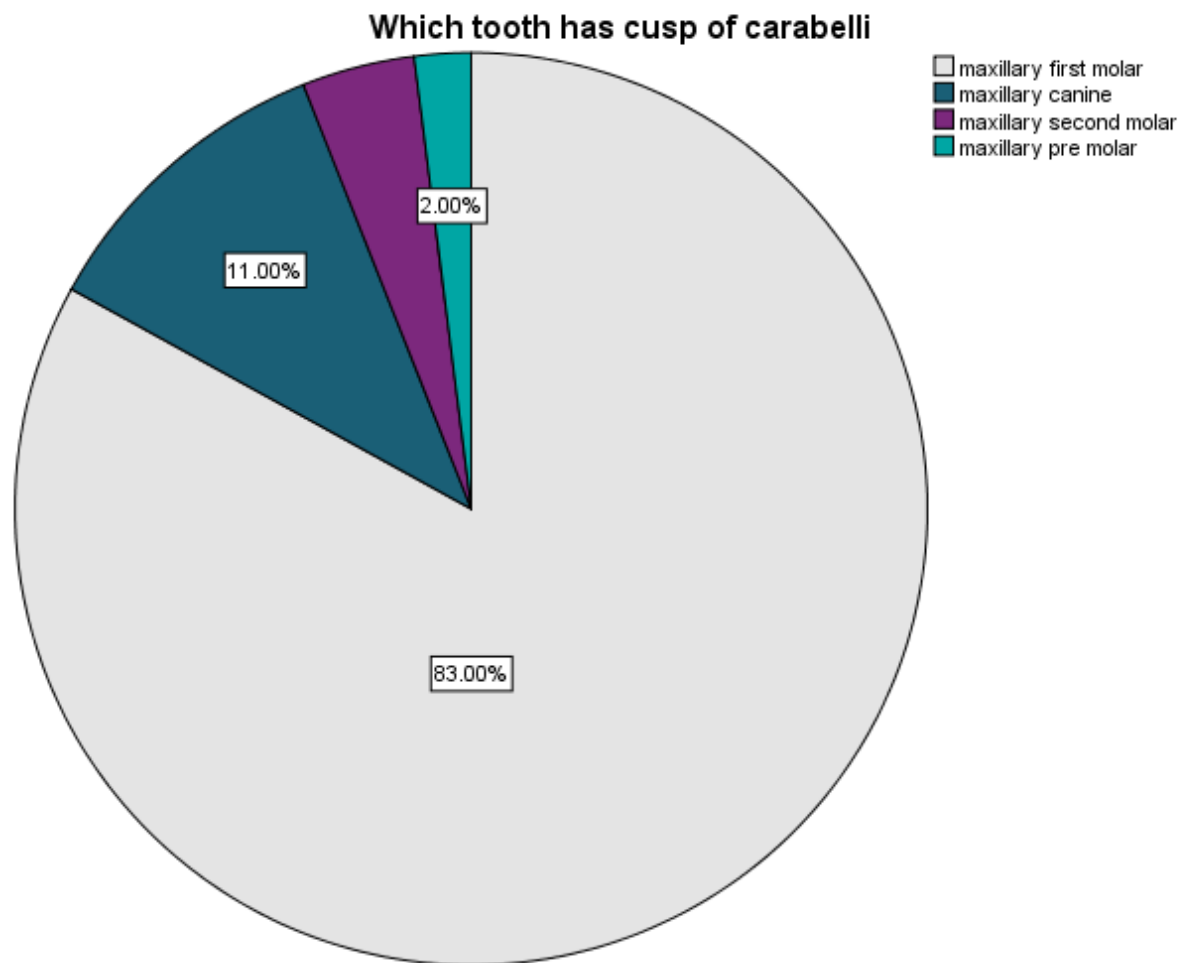


Fig 6 : The pie chart shows the responses of the cusp of carabelli in which tooth. Turquoise blue represents maxillary canine , turquoise green represents the maxillary second molar, Purple represents maxillary premolar.(83%) chose maxillary first molar (11%) chose maxillary canine(2%) chose maxillary premolar and (4%) chose maxillary second molar

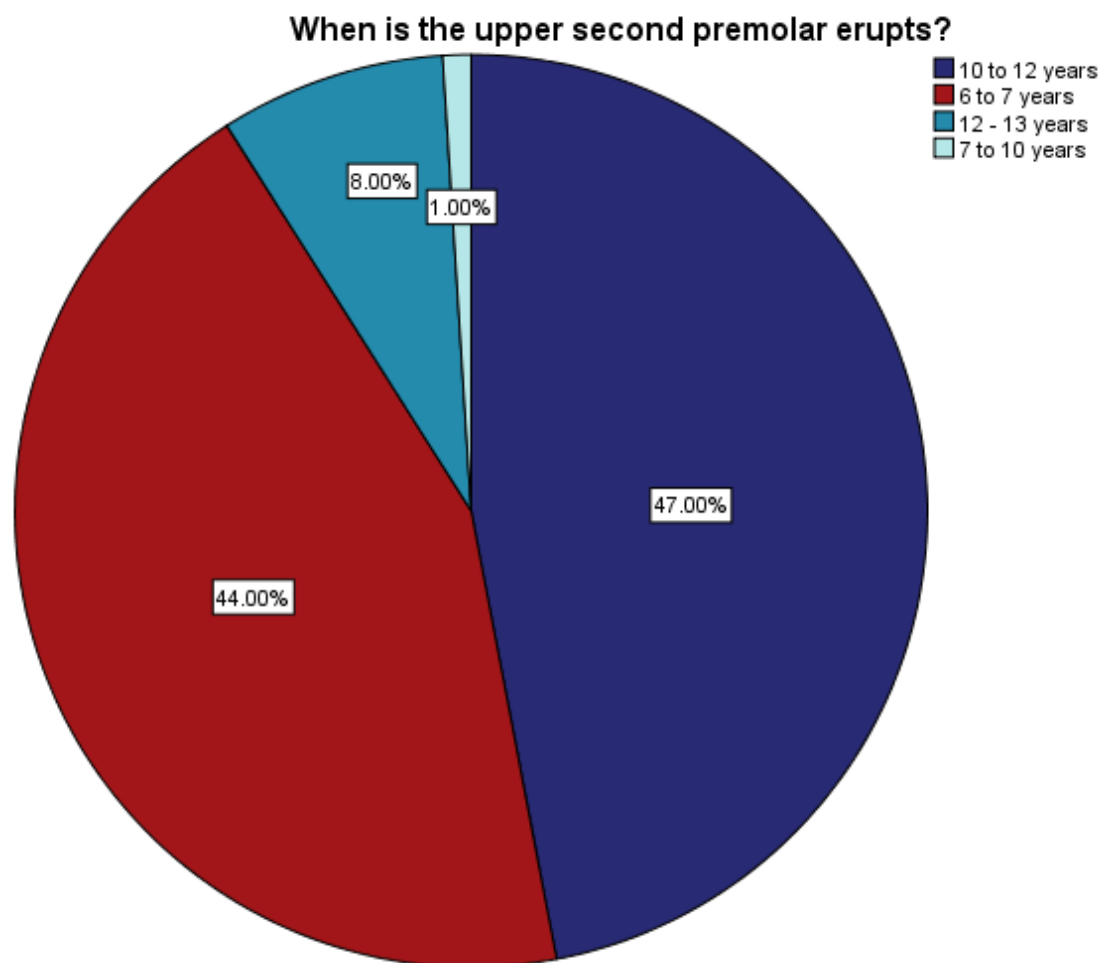


Fig 7 : The Pie chart shows the responses of upper second premolar eruptions .Turquoise blue represents 12-13 years, Light blue represents 7 to 10 years,red represents 6-7 years .(47%) choose 10to

12 years, (44 %)choose 6 to 7 years,(8%)choose 12 to 13 years and(1%) choose 7 to 10 years.

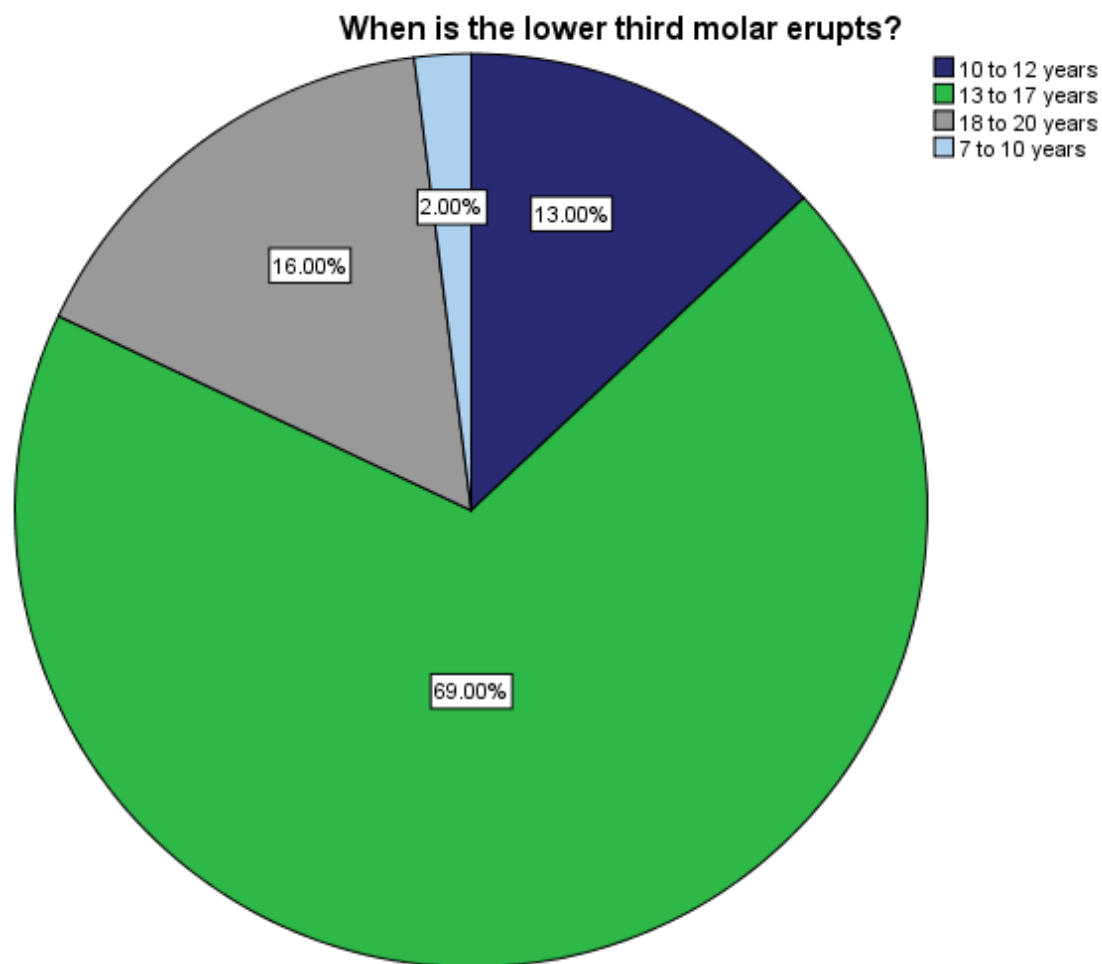


Fig 8 :The pie chart shows the responses of the lower third molar eruption .Dark Blue represents 10 -12 years. Green represents 13 to 17 years. Grey represents 18 to 20 years. Light blue represents 7 to 10years. (69 %) choose 13 to 17 years, (16%)choose 18 to 20 years,(13%) choose 10 – 12 year ,(2%) choose 7 to 10years.

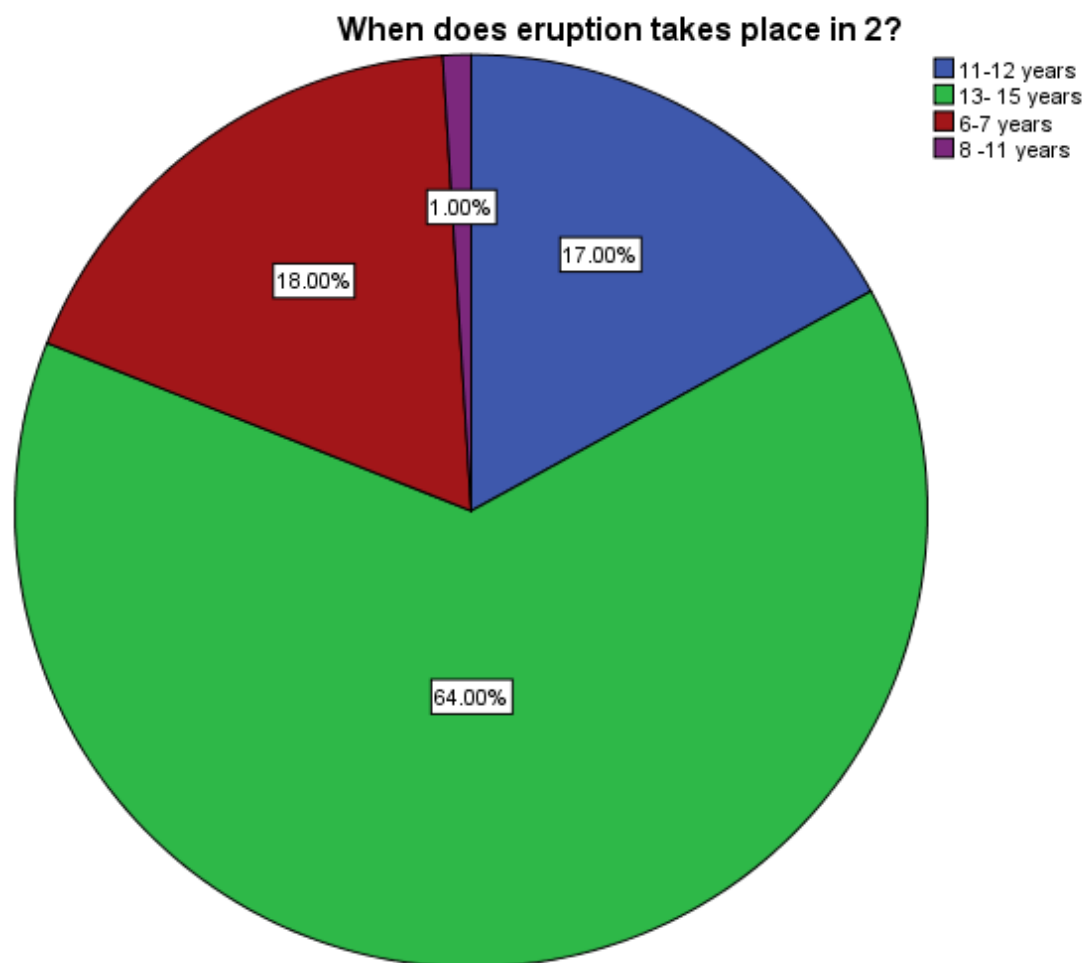


Fig 9: The pie chart shows the responses of the canine eruption period . Blue represents 11-12 years. Green represents 13 – 15 years, Red represents 6 – 7 years, Purple represents 8 - 11 years. (64 %) chose 13 – 15 years, (18 %) chose 6 – 7 years, (1%) chose 8 to 11 years and (17 %) chose 11-12 years.

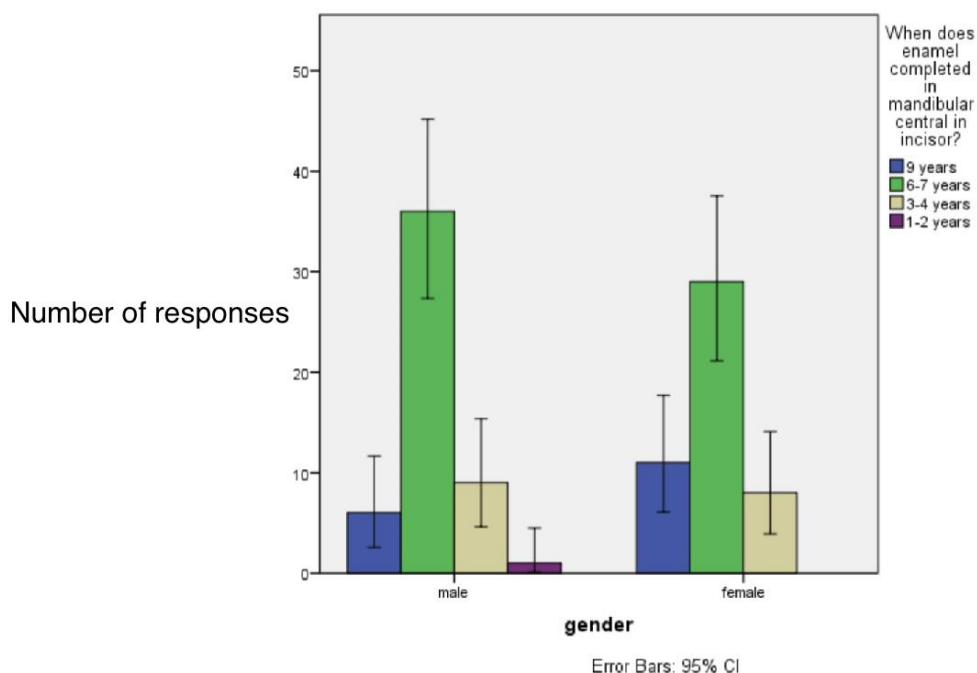


Fig 10: Bar graph shows association between gender and question regarding calcification in mandibular central incisors. The X-axis represents the gender and Y-axis represents the percentage of responses for the enamel completion in the mandibular central incisor. Olive green represents 9 years. Dark green represents 6-7 years. Yellow represents 3-4 years and light purple represents 1-2 years. Majority of males (36%) were aware about the enamel completion in the mandibular incisor when compared to females (29%). The Pearson chi square test shows p value is 0.283 (p value > 0.05) hence it is statistically not significant.

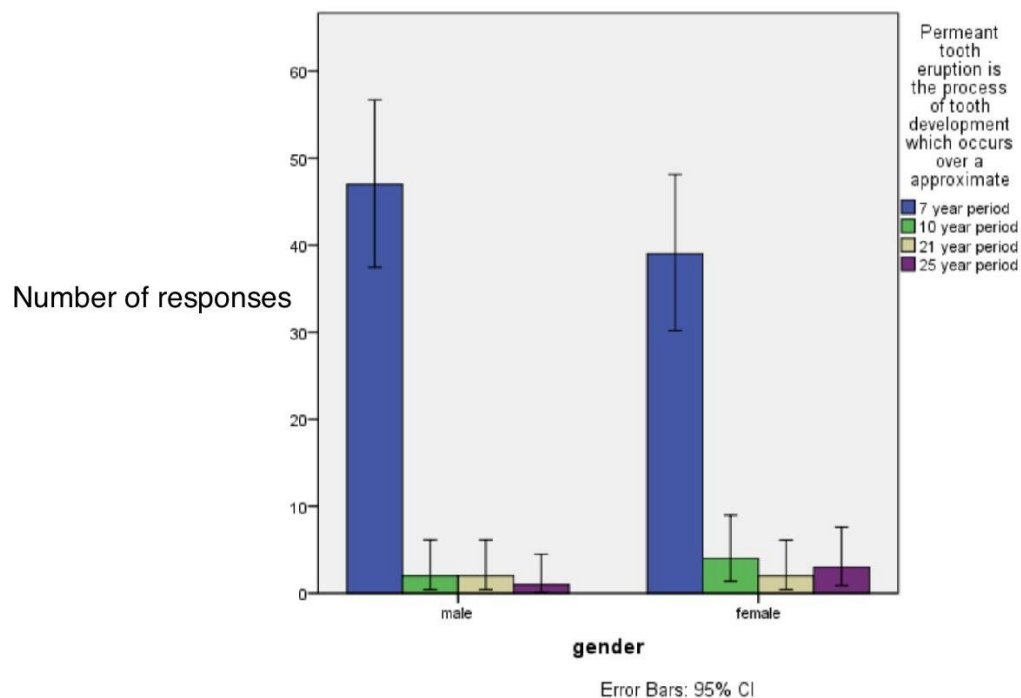


Fig 11:Bar graph shows the association between gender and permanent tooth eruption which occurs over approximate years. X-axis represents the gender and Y-axis represents the percentage of responses for the time period of permanent tooth eruption. Green represents 7 years. Grey represents 10 years. Pink represents 21 years and red represents 25 years. Majority of males (47%) have responded to a 7 years period whereas females have only responded to (39%).pearson chi square test shows p value is 0.521(p value > 0.05) hence it is statistically not significant.

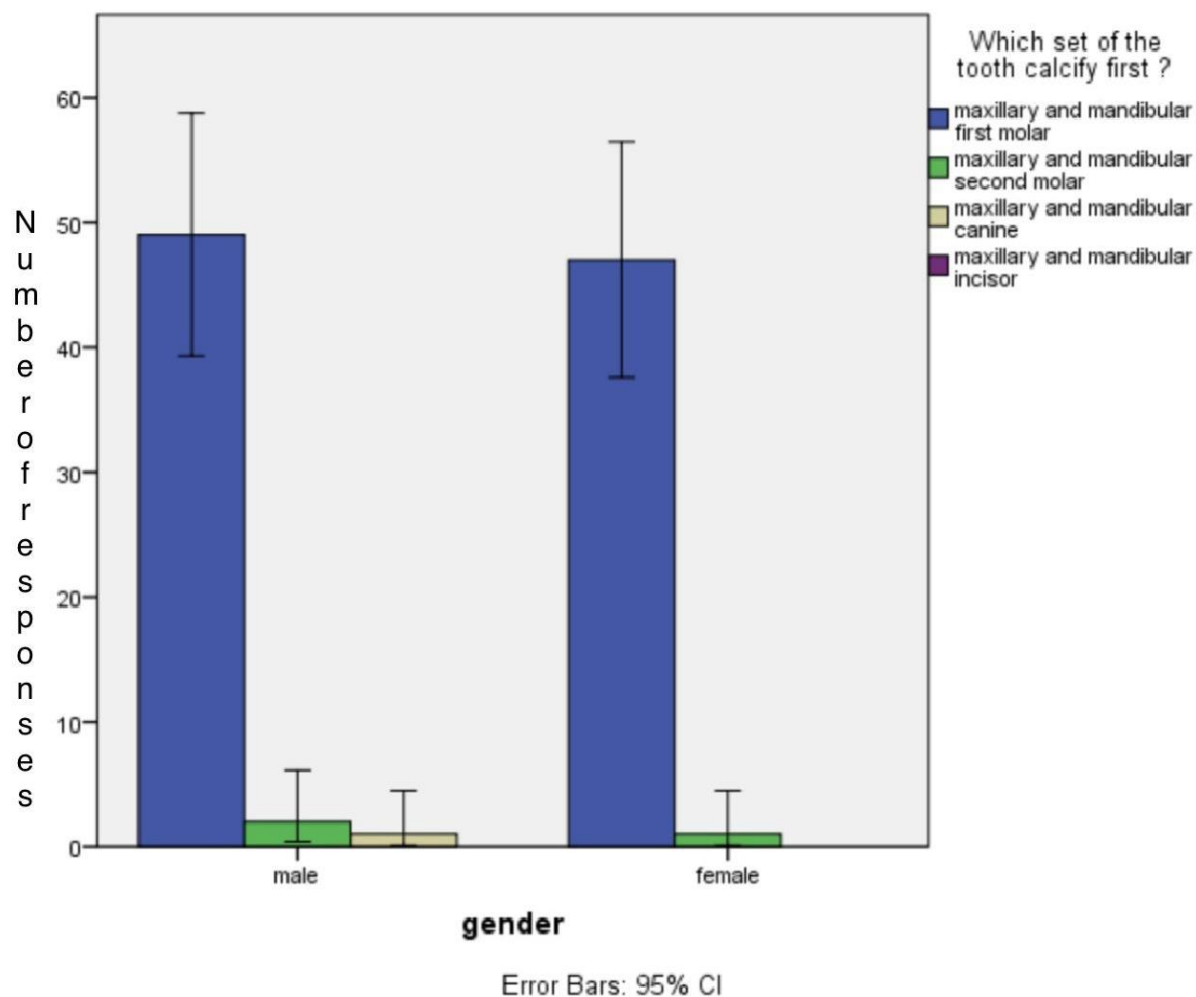


Fig 12: Bar graph shows the association between gender and tooth calcification first. X-axis represents the gender and Y-axis represents the percentage of responses for the teeth that calcify first. Light Blue represents maxillary and mandibular first molar. light purple represents maxillary and mandibular second molar. Turquoise green represents maxillary and mandibular canine. Majority of males have responded to (49%) have responded to maxillary and mandibular first molar and females (47%) have only responded to maxillary and mandibular first molar. Pearson chi square test shows p value is 0.544 (p value > 0.05) hence it is statistically not significant.

DISCUSSION

In the present study, the number of participants is 48 % female and 52 % male in the first year undergraduate in the research of morphology, calcification and eruption of permanent tooth. In our study, males (52%) have more knowledge about permanent teeth when compared to females(48%). The association between the gender and percentage of response for permanent tooth eruption gives a p-value of 0.521(p value > 0.05) in pearson chi square test and in our study males (49%) have more knowledge about which set of tooth calcify first when compared to females(47%) The association between the gender and percentage of response for permanent tooth eruption gives a p-value of 0.544(p value > 0.05) in pearson chi square test .

Maxillary canines are a total of four in the mouth. Canine ensures the normal facial expression at the corners of the mouth. They are commonly referred to as a cornerstone of the dental arches. Canines have the longest root in the permanent tooth and Canine has the most stable in the mouth, it has excellent anchorage, and self-cleaning ability.(4),(5,6),(7) In the present study, 97% of the students were aware that canine has the longest root whereas 3% of students were unaware. Maxillary canines first evidence of calcification takes 4 to 5 months(8). The complete formation of enamel in Maxillary canines is 6 to 7 years. The eruption period in Maxillary canine is 11 to 12 years. The complete formation of roots in Maxillary canine is 13 to 15 years. In our present study 18% have chosen 6 to 7 years as an eruption period in canine whereas 82% have not chosen 6 to 7 years. Mandibular first molars are larger than other mandibular teeth.

Mandibular first molars have two roots: mesial and distal (10,11). All mandibular molars have crowns that are roughly quadrilateral in shape and have longer mesiodistally than buccolingually. In Mandibular the first molar smallest cusp is distal buccal cusp (4)(6,9). In our study, 96% of the responses have chosen distal buccal cusp as the smallest cusp in the mandibular first molar.

Maxillary first molar is the largest and strongest maxillary tooth. It is bulky and helps in anchorage. It is placed at the center of a fully developed jaw which is antero posteriorly. Maxillary molar is also called the cornerstone of the dental arch. It helps in maximum storage and helps in mastication of food (10,11). Cusp of maxillary first molar is attached to the mesiolingual surface of the mesiolingual cusp. Maxillary first molar is outlined occlusally by an irregular development groove which is the beginning depression of the mesiolingual line of the crown(4). In our research 85% of the student

responses chose cusp of carabelli is present in maxillary first molar. In this study , we observed the knowledge about morphology, calcification, eruption of permanent teeth among first year ug dental students. Most of the males have adequate knowledge when compared to females on knowledge on morphology, calcification, eruption of permanent teeth. Study is insignificant because this study was done on a small scale population, in future such study should be done on a large scale population, the result may be accurate and there may yield new findings. Theory classes can be combined with interactive sessions like identifying the given natural tooth and Students can be taught with more pictorial powerpoint presentations to overcome the knowledge gap. Tooth carving helps students to appreciate and have a better understanding of morphology present in the permanent tooth .

CONCLUSION

The present study has concluded in first year dental students that male had more knowledge when compared to females in morphology, calcification, and eruption of permanent teeth . However, the study has to be conducted in a large population and involves various dental colleges.

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CONFLICT OF INTEREST

All the authors declare that there was no conflict of interest in present study

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