

Knowledge And Awareness About Developmental Defects Of Teeth - A Survey Among Preclinical Ug Students

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ABSTRACT

AIM: To assess the knowledge of developmental defects of teeth among preclinical UG students.

BACKGROUND: Developmental disturbances are the abnormalities where the pathology starts in the embryonic stage before the formation of dentition. It includes the defect in the size , number, shape ,enamel and dentine of the tooth.

MATERIALS AND METHOD: A cross sectional study was conducted among dental students in a private college. A self made questionnaire was prepared using Google forms and was circulated. The results were formulated and analysed in SPSS software version 23.

RESULTS: According to the study conducted, the second year students had more knowledge about the developmental defects of teeth than the first years. From pearson chi square test p value =0.09 hence statistically insignificant.

CONCLUSION: The knowledge about the developmental defects of teeth is very important among dental students to prevent misdiagnosis and inappropriate treatment as all the developmental defects do not require treatment.

Keywords: Anomalies, Developmental defects,Dentition , Hypoplasia, Innovative methods

INTRODUCTION :

The hard tissues of the teeth were enamel, dentine and cementum. Formation of these dental hard tissues are controlled by the genes and are also affected by the epigenetic and environmental factors(1). Environmental changes such as medical illness, trauma, radiation, and poisons are responsible for some of the developmental defects of our teeth. (1,2). There is a poor quality of mineralization due to the abnormalities of developmental pathways (3). Developmental defects of teeth in primary dentition may be due to nutritional problems or episodes of infection in childhood (4). Some abnormalities of the enamel are hypomineralization, hypoplasia, presence of enamel in pits or hypomaturation where the translucency of the tooth is affected (5). Translucency of teeth is affected due to diffuse opacity or demarcated opacity. In diffuse opacity ,it's distributed over a relatively large area whereas in demarcated opacity it's confined to a relatively smaller area(6).

Developmental defects also include the discoloration of teeth. Enamel defects may lead to certain inherited conditions which may be grouped into amelogenesis imperfecta and hereditary systemic conditions. Amelogenesis imperfecta is when the developmental defects is restricted to the teeth and hereditary systemic conditions associated with defects in epithelial tissue or pathway of mineralisation(7). Inherited conditions of defects of mineralization also involve Parathyroid glands and vitamin D disorders which include hypoparathyroidism which is known to cause hypomineralization and hypoplasia(8).

The knowledge about developmental defects of teeth is very important as they are the deviation from normal morphology of the tooth. Developmental defects can be easily mistook as disorders even if they are harmless. Hence to prevent misdiagnosis and for effective treatment plan knowledge on developmental defects are important. Thus, it is important for the students to understand the developmental defects to diagnose promptly and manage efficiently and innovative technologies can be used to strengthen their knowledge. Our team has extensive knowledge and research experience that has translated into high quality publications (9-28). The main aim of this study is to evaluate the developmental defects of teeth among preclinical dental students. This study aims to assess the knowledge about developmental defects of teeth among pre clinical dental students.

MATERIALS AND METHOD

Study design

A cross sectional study was conducted through an online survey from February to April 2021 among undergraduates.

Study subjects

A simple random sampling was used to select the study participants. All the preclinical dental students who were willing to participate were included. A sum of 100 participants participated in this study.

Ethical considerations

Returning the filled questionnaire was considered as implicit consent as a part of the survey. Ethical approval for the study was obtained from the Institutional Review Board (IRB), Saveetha Dental College.

Study methods

Self administered questionnaire of close-ended questions was prepared and it was distributed among dental students from February to April 2021 through the online survey "google forms". The collected data were checked regularly for clarity, competence, consistency, accuracy and validity. Demographic details were also included in the questionnaire.

Statistical analysis

Data was tabulated in excel sheet and analysed with SPSS version (23.0). Descriptive statistics as percent were calculated to summarise qualitative data and interpreted as pie charts and bar graphs. 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.

The questionnaire contained the following questions.

1. Identify the picture



a)hypercementosis

b)Hyperdontia

c)Accessory root

d)No idea

2.Total absence of teeth

a)hypodontia

b)anodontia

c)hyperdontia

d)no idea

3.Teeth with very small roots are called

a)dwarf roots

b)Hypodontia

c)anodontia

d)No idea

4.In which of the following the teeth appear smaller than usual

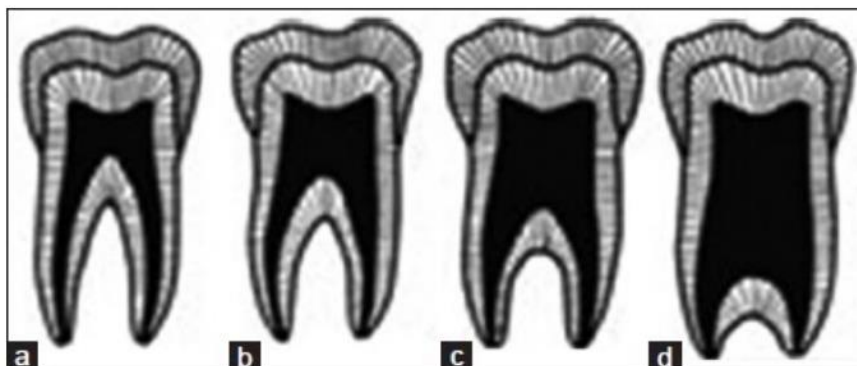
a)microdontia

b)hypodontia

c)Microdontia & hypodontia

d)none of the above

5.Select the option



a)A:Hypotaurodontism D:Hypertaurodontism

- b) B: hypotaurodontism D: Hypertaurodontism
- c) B: hypotaurodontism D: mesotaurodontism
- d) No idea

6. Identify the image



- a) Dilaceration
- b) Concrescence
- c) flexion
- d) no idea

7. Cementum of overlaying roots are joined



- a) fusion
- b) Concrescence
- c) flexion

d) Dilaceration

8. Excessive buildup of cementum is called

- a) Hypercementosis
- b) Hypocementosis
- c) Cementogenesis
- d) Cementocytosis

9. Identify the below image



- a) Dilaceration
- b) Concrecence
- c) Enamel pearl
- d) Flexion

10. Presence of enamel in abnormal surfaces of tooth

- a) Enamel tubercle
- b) Enamel pearl
- c) Cusp
- d) Ectopic enamel

In the results section, phrase words like "The association between so n so was evaluated using Pearson chi square test and the p value is

RESULTS

The survey was conducted among the dental students of a private dental college and among which 49% of the participants belonged to the second year and 51 % were first year. Among the total study participants 57% were females and 43% were males. Among the total population 91% identified accessory roots , but the rest 9 % chose the wrong option out of which 5% had no idea of the image and 4 % thought it was hypercementosis(Figure 1) .Majority of the population (90%) participants were not aware about anodontia, only 7% of the participants were about anodontia (Figure 2). And 68 % of the population had no idea about taurodontism but only 20% were aware about taurodontism (Figure 5).Most of the population (96%) were aware that cementum of overlaying roots is called fusion but the rest 4 %were not aware of fusion (Figure 7). Among the total population 45 % of the participants from 1st year and 49 % of participants from second year were aware about hypercementosis . The association between the knowledge of hypercementosis and students from different years was evaluated using pearson chi square test and the p value is 0.280 hence the value is statistically insignificant (Figure 11). Only 1 % of first years and 6 % of second had knowledge about anodontia . The association between the knowledge about anodontia and the students of different years was evaluated using pearson chi square test and p value is 0.090 hence the value is statistically insignificant (Figure 12). Only 12% from first years and 13% from second years had knowledge about ectopic enamel. The association between knowledge of ectopic enamel and students of different year was evaluated using pearson chi square test and the p value is 0.280 hence the value is statistically insignificant (Figure 13).

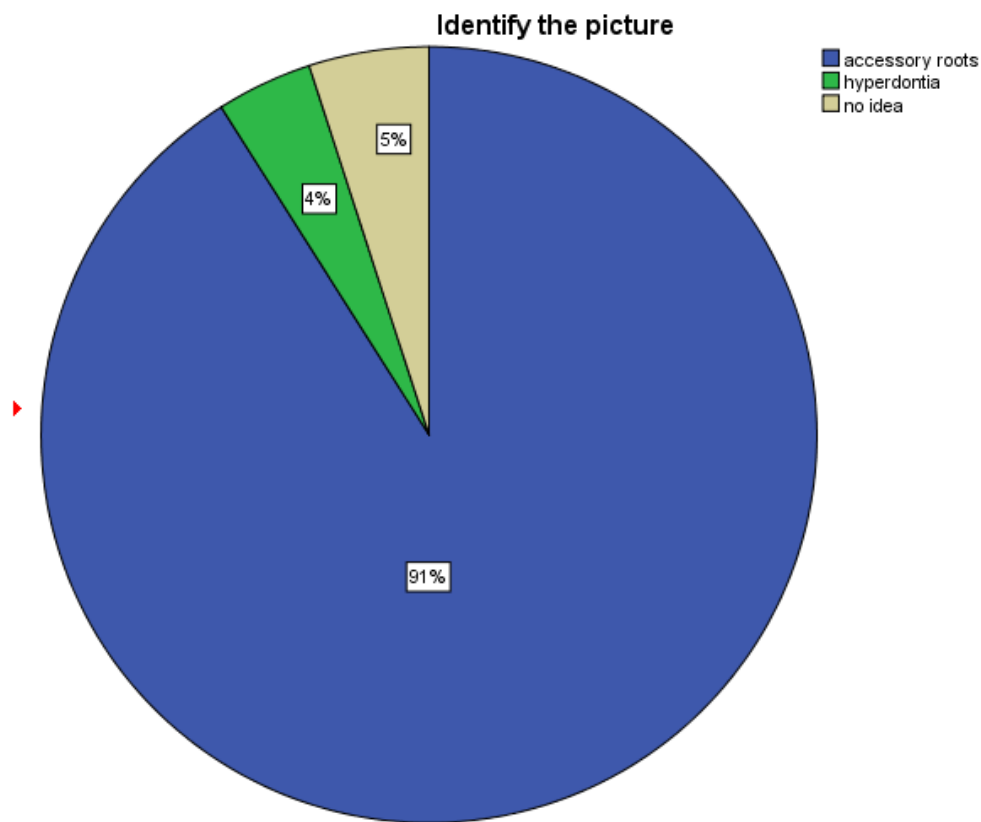


Figure 1: Pie chart which shows the percentage of responses of the participants for identifying the picture of accessory root . Blue represents “ hypercementosis” , green represents” hyperdontia” and antique white represents “no idea”. Majority of the participants(91%) identified the image correctly as accessory roots , but the rest 5% had no idea of the image and 4 % thought it was hyperdontia .

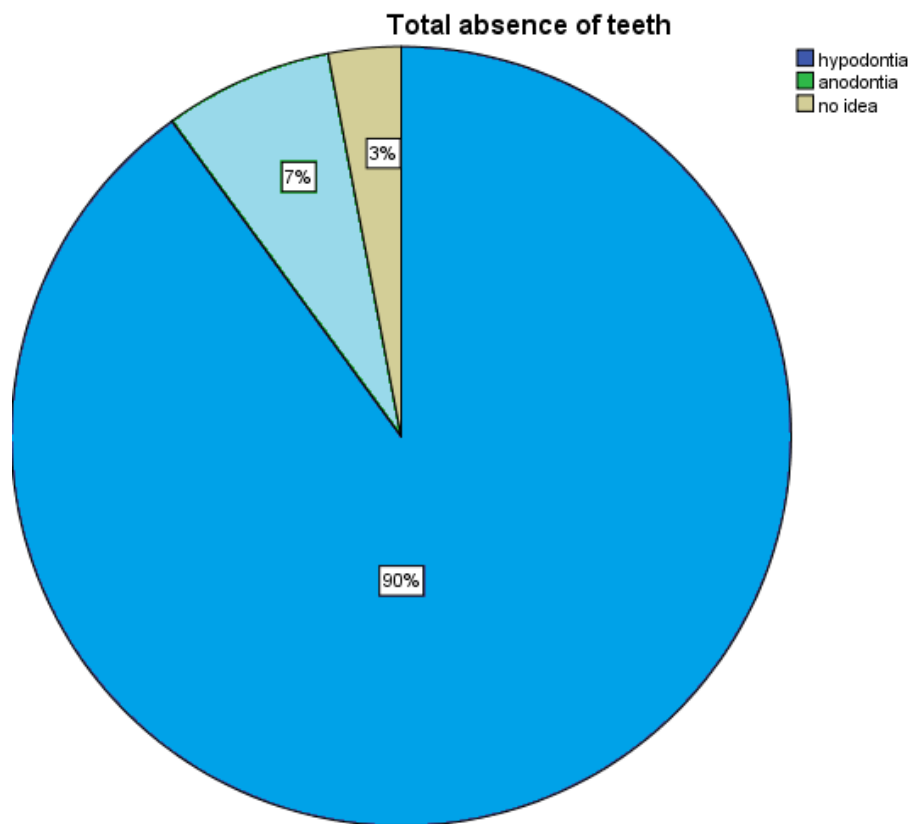


Figure 2: Pie chart shows the percentage of responses of the participants for identifying the total absence of teeth , anodontia. Dodger blue represents “hypodontia” ,deep sky blue represents ' ' anodontia” and antique white represents “no idea”. Majority of the population (90%) participants chose the option hypodontia and 3% had no idea of anodontia ,only 7% of participants had knowledge about anodontia.

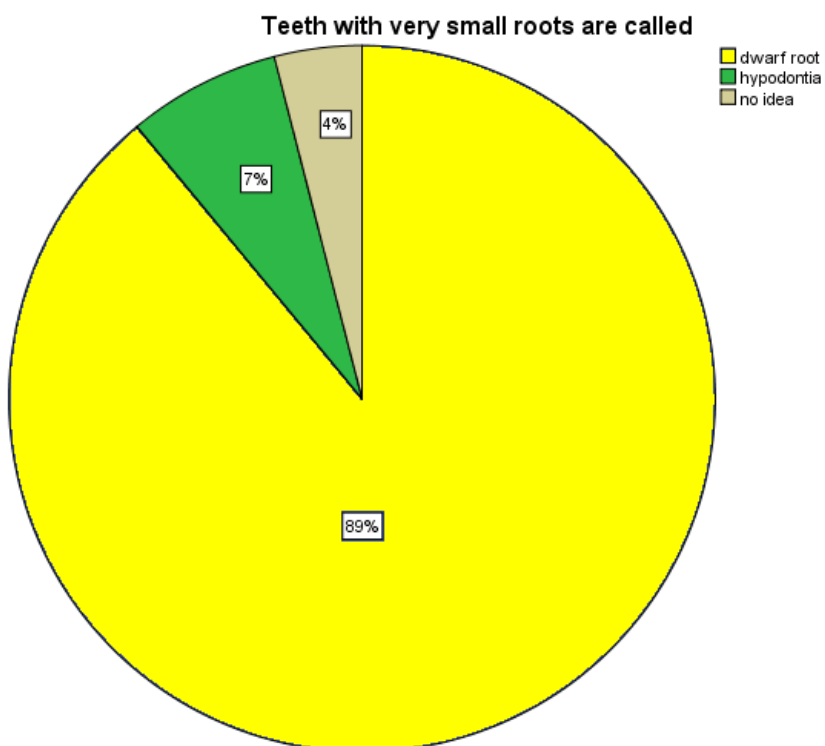


Figure 3: Pie chart shows the percentage of responses of the participants for the question of “what are very small roots called?”. Yellow represents “dwarf roots”, green represents “hypodontia”, antique white represents “no idea”. Majority of the population (89%) identified it correctly as dwarf roots, 7% chose the option hypodontia and 4% had no idea..

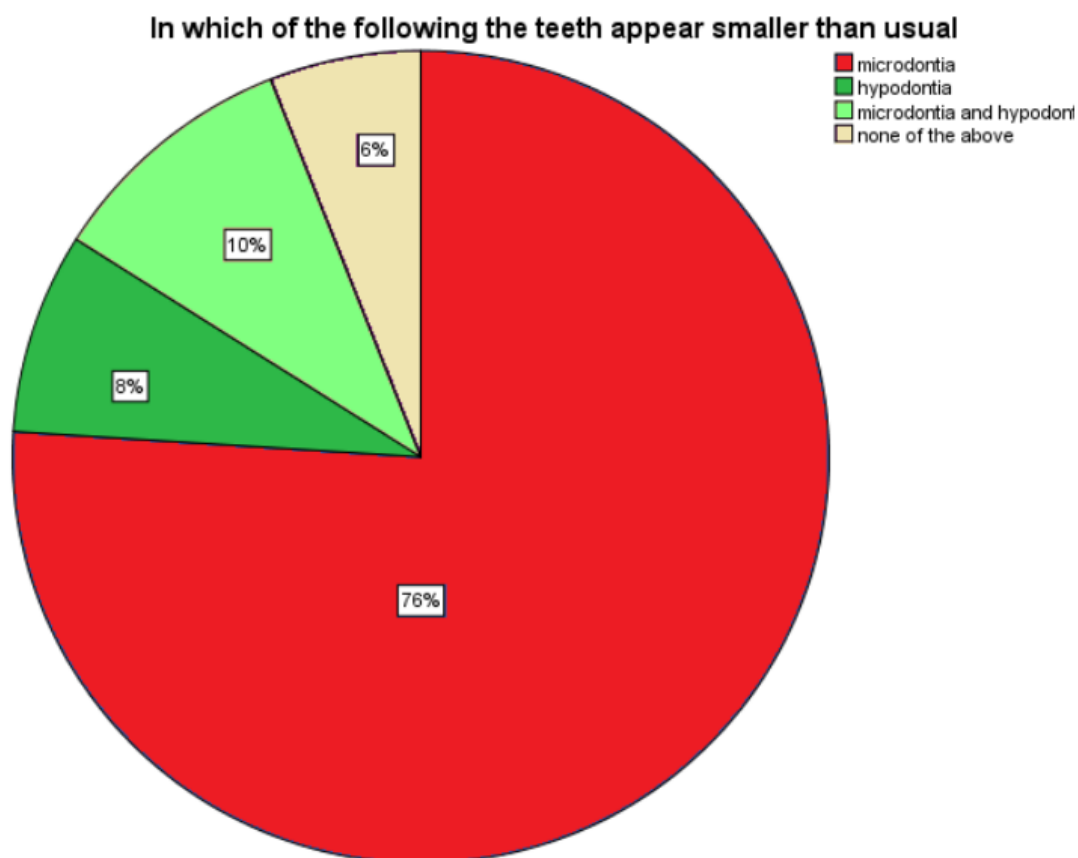


Figure 4: Pie chart shows the percentage of responses of the participants for identification of microdontia. Among the total participants. Red represents "microdontia", green represents "hypodontia", Light green represents "microdontia and hypodontia", Antique white represents "none of the above". 76% gave the right response but 10 % of participants chose the option "both microdontia and hypodontia", and 8 % of the participants mistook it as hypodontia.

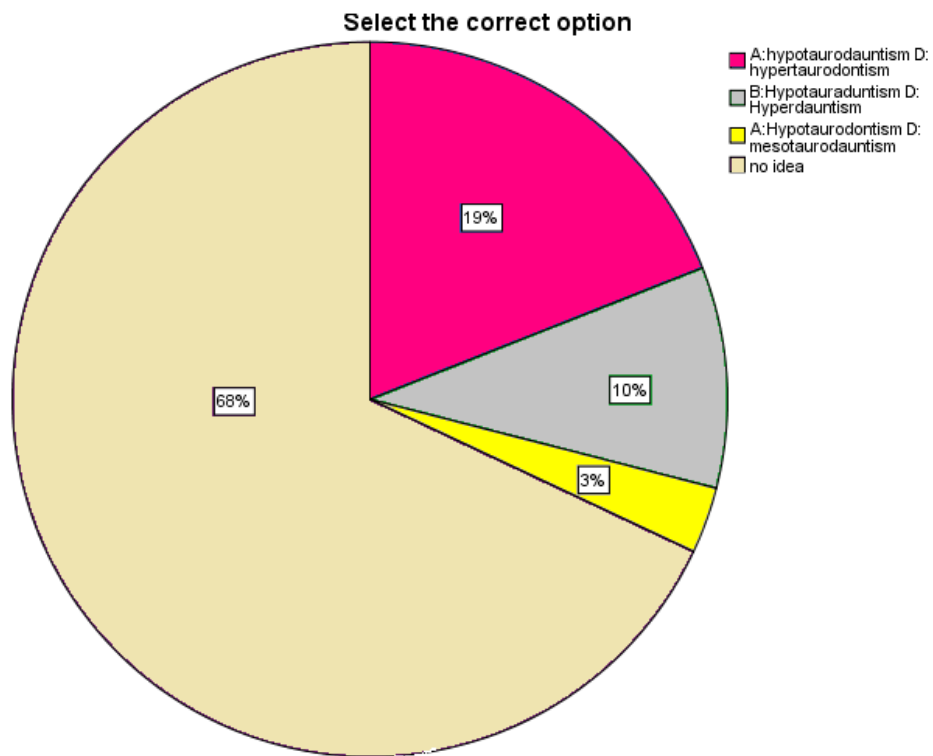


Figure 5: Pie chart shows the percentage of responses of the participants for knowledge of taurodontism. Antique white represents “no idea”, Pink represents “B: hypotaurodontism D: Meso Taurodontism”, Yellow represents “A: hyper taurodontism D: hyper taurodontism”, Lavender represents “B: hyper taurodontism D: hyper taurodontism”. 68 % of the population had no idea of what taurodontism was but about 19% had a depth knowledge about taurodontism.

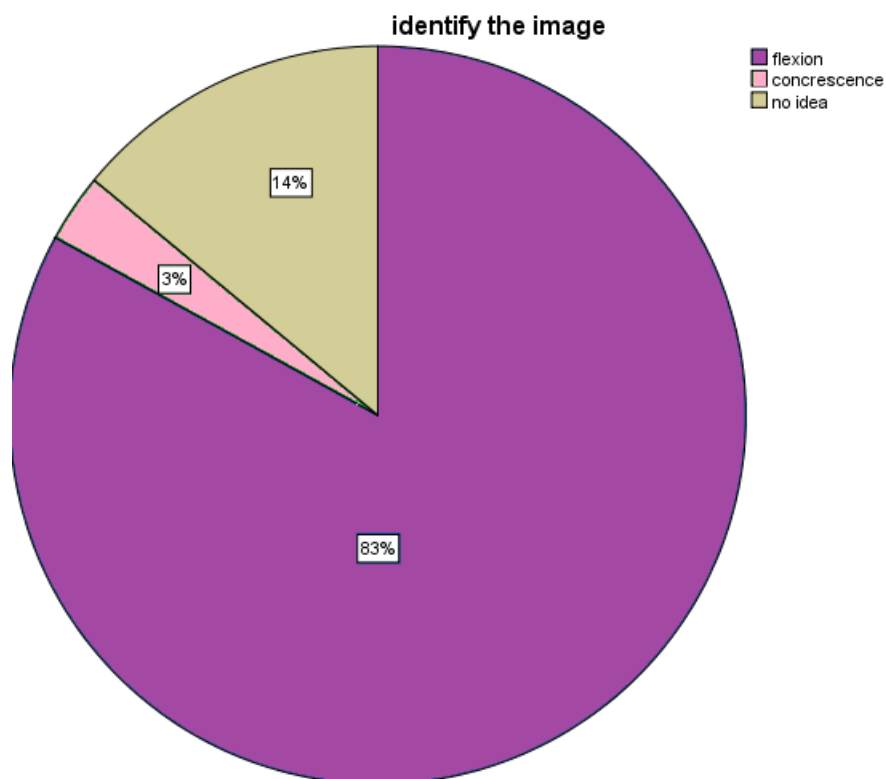


Figure 6: Pie chart shows the percentage of responses of the participants for identifying flexion .Slate blue represents "Dilaceration", Pink represents "Concrescence",Antique white represents "No idea ". 83 % of the population identified the image correctly and 3 % chose dilaceration and 14 % had no idea.

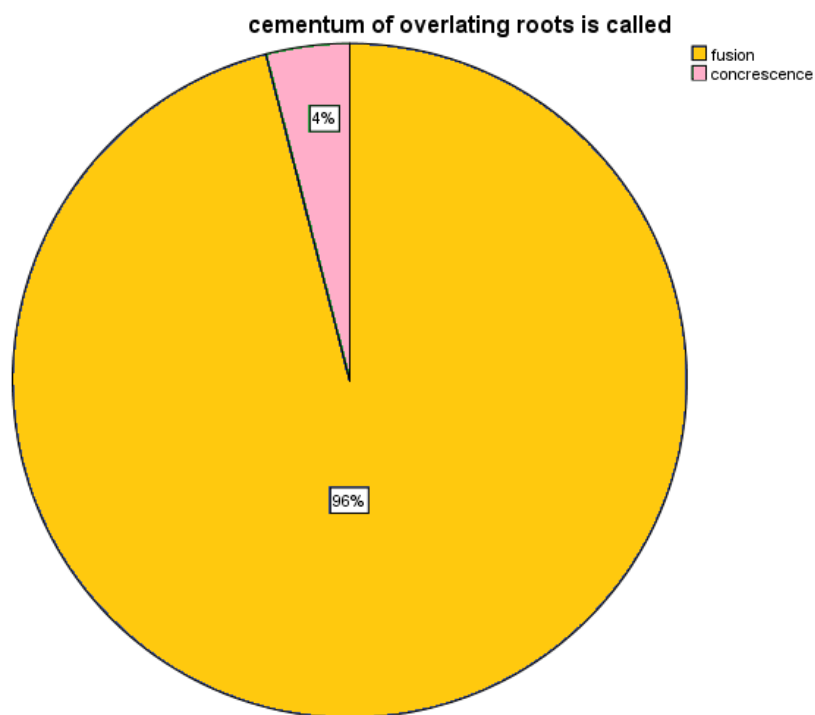


Figure 7: Pie chart shows the percentage of responses of the participants for the question “what is the cementum of overlaying roots called?”. Orange represents “Fusion” and Pink represents “Concrecence”. Most of the population (96%) chose fusion ,only 4% of the population were aware about concrecence.

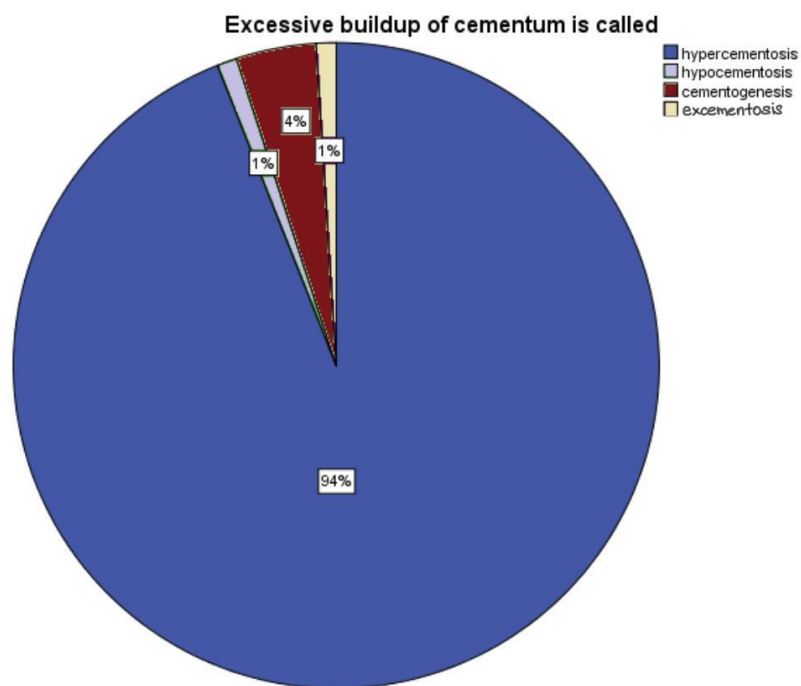


Figure 8: Pie chart shows the percentage of responses of the participants for the knowledge of hypercementosis, Dark blue represents “Hypercementosis”, Lavender represents “hypocementosis”, Dark red represents “cementogenesis”, Beige represents “excementosis”. Most of the participants (94%) were aware about hypercementosis and 4 % - cementogenesis, 1% -cementocytosis and the rest 1% as hypocementosis.

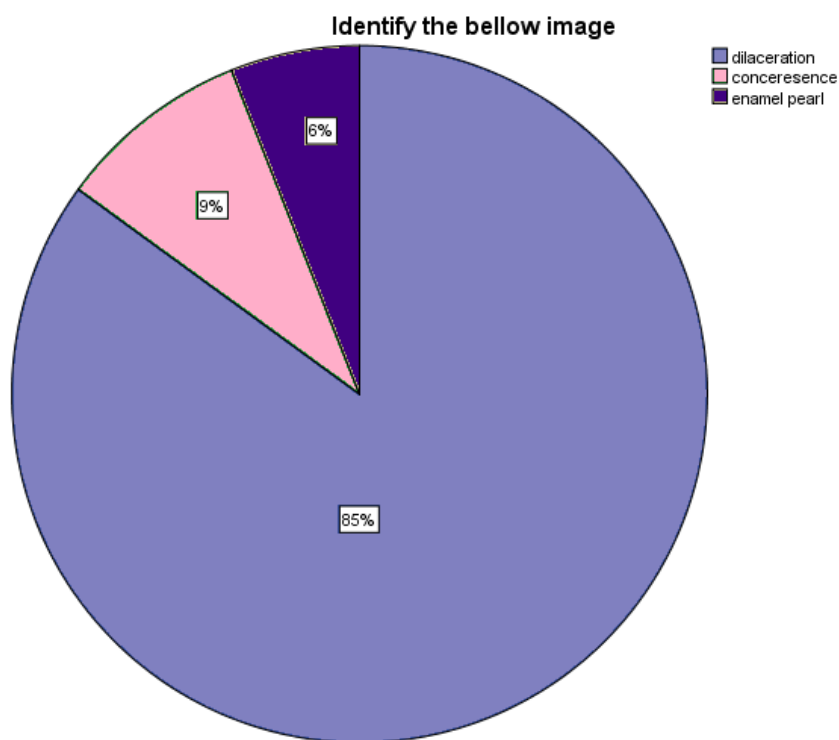


Figure 9: Pie chart shows the percentage of responses of the participants for identification of dilaceration. Medium purple represents "Dilaceration", Pink represents "concrescence", Indigo represents "enamel pearl". Most of the population (85%) identified the image correctly as dilaceration. About 6% chose enamel pearls and 9% selected concrescence.

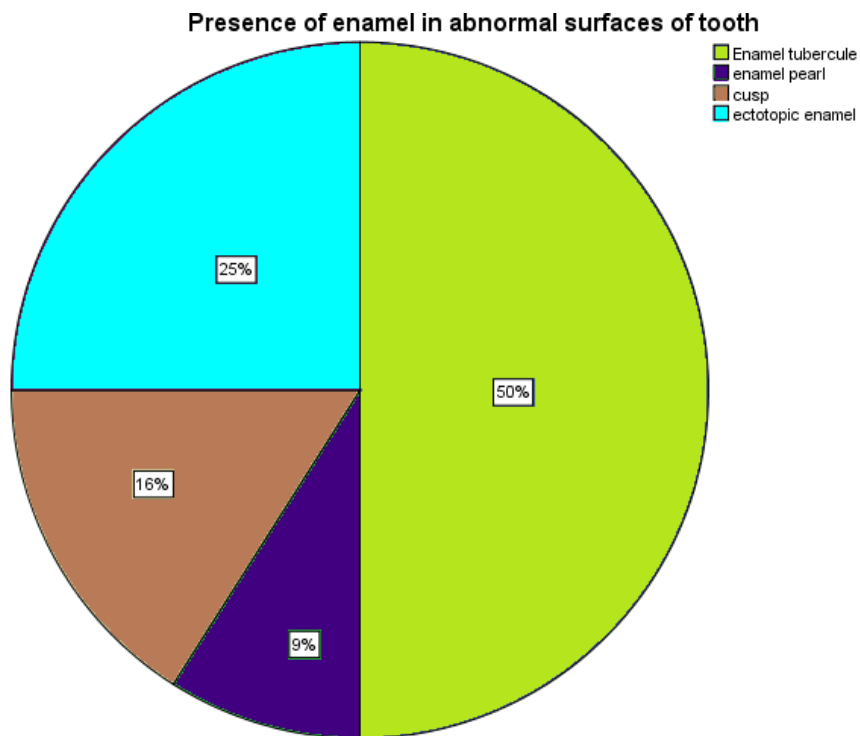


Figure 10: Pie chart shows the percentage of responses of the participants for the presence of enamel in abnormal surfaces of the tooth. Yellow green represents "Enamel tubercle", Indigo represents "enamel pearl", Brown represents "cusp", Aqua represents "ectopic enamel". Only half the population (50%) were aware of ectopic enamel. 25 % mistook it as enamel tubercle, 16 % as cusp and 9 % as enamel pearl.

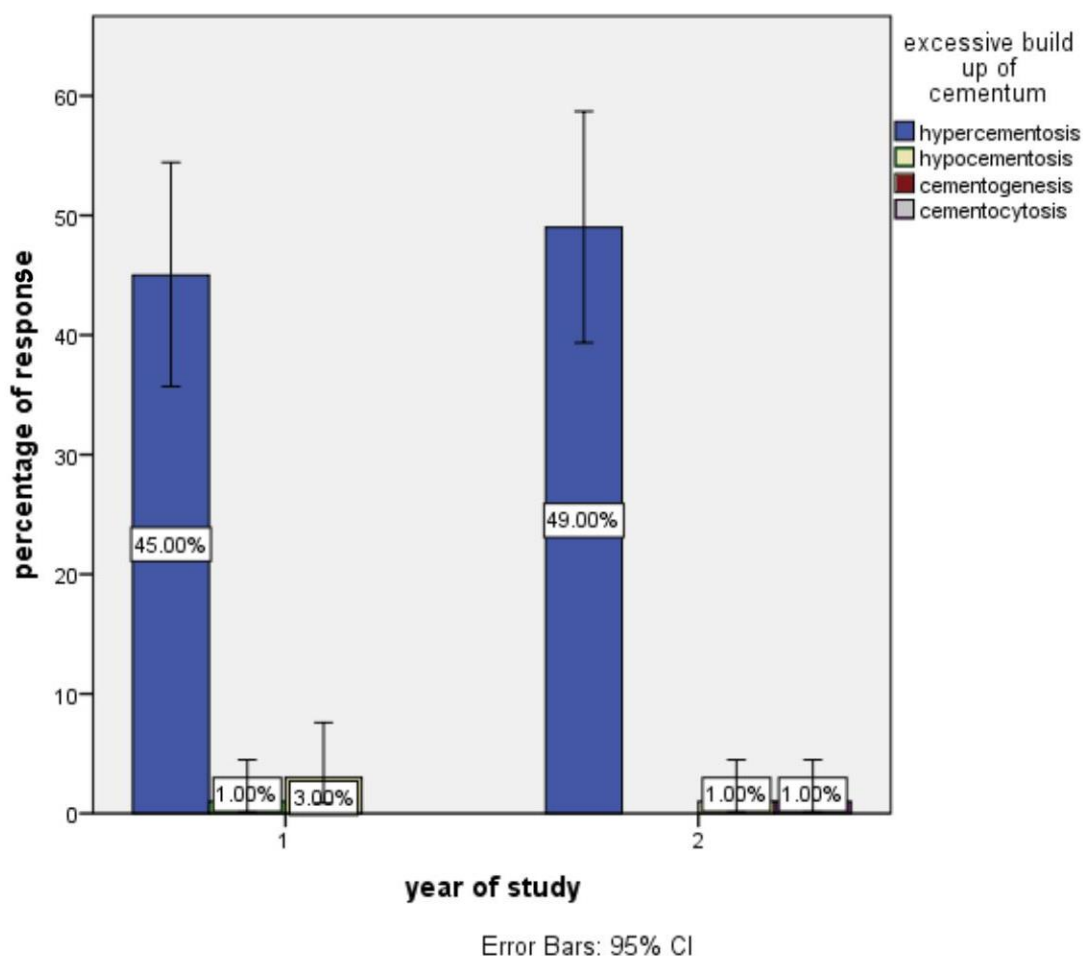


Figure 11: The bar graph represents the association between years of study and their knowledge about hypercementosis. X axis represents the year of study and Y axis - percentage of responses. Dark blue represents “Hypercementosis”, Lavender represents “hypocementosis”, Dark red represents “cementogenesis”, Beige represents “cementocytosis”. Majority of second years (49%) were aware about hypercementosis when compared to first year students (45%). Pearson chi square test shows p value is 0.280 (p value >0.05). Hence it is not statistically significant.

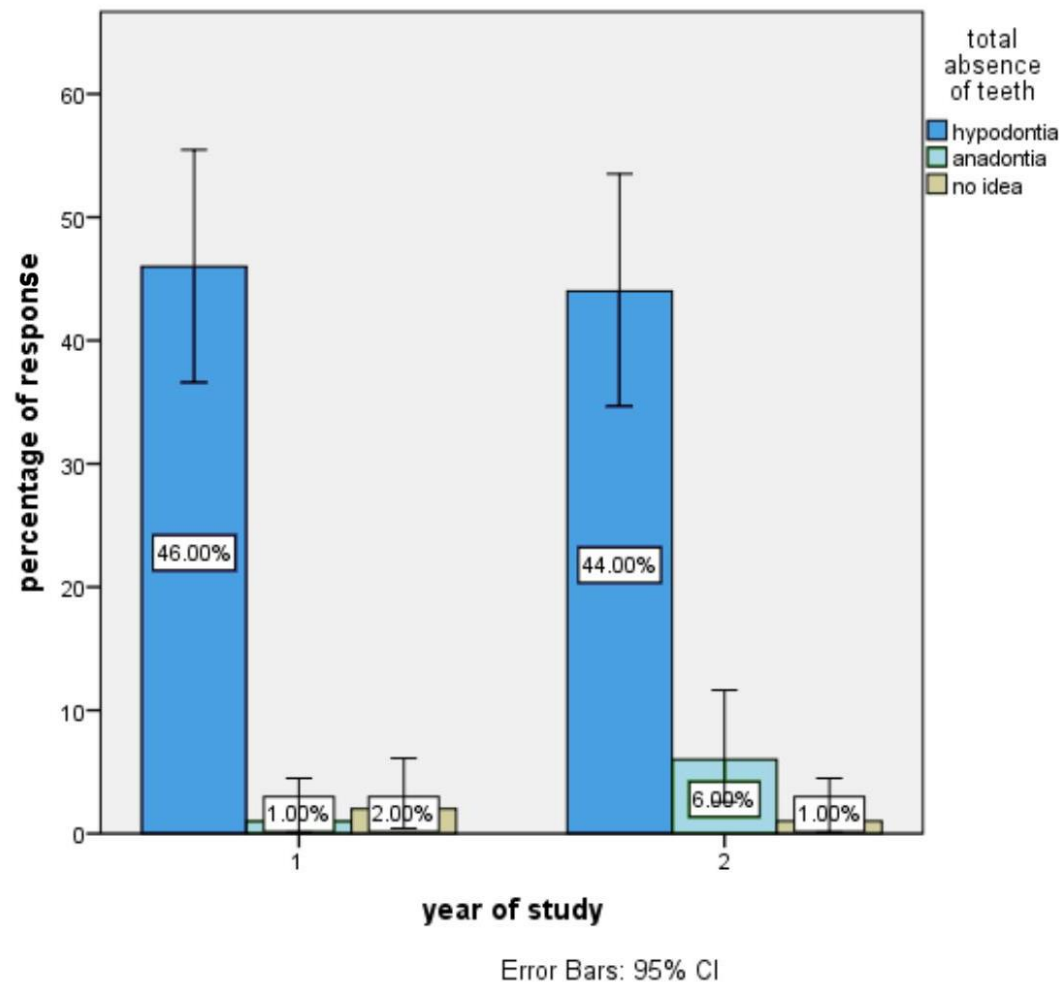


Figure 12: The bar graph represents the association between the knowledge of anodontia and year of study. X axis represents the year of study and Y axis - percentage of responses. Green represents the correct answer, anodontia. Dodger blue represents "hypodontia", deep sky blue represents "anodontia" and antique white represents "no idea". Only 6% of second years were aware about hypercementosis when compared to first year students (1%). Pearson chi square test showed that the p value is 0.09 (p value > 0.05), hence the value is not statistically significant.

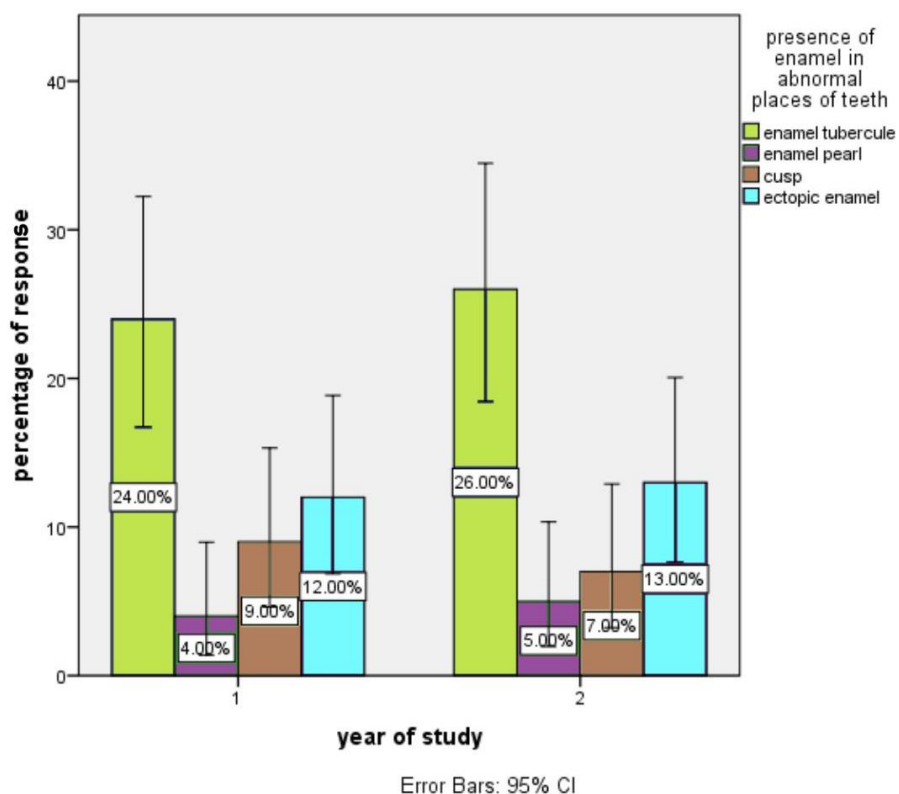


Figure 13: depicts the association graph between year of study and their knowledge of ectopic enamel. X axis represents the year of study of the participants and Y axis - percentage of responses. Yellow green represents “Enamel tubercule”, Indigo represents “enamel pearl”, Brown represents “cusp”, Aqua represents “ectopic enamel”. Only 12% of first years were aware of ectopic enamel when compared to second years (13%). Pearson chi square test showed that the p value is 0.932 ($p > 0.05$), hence the value is not statistically significant.

DISCUSSION

In this study, the majority of the participants were aware of developmental defects of teeth among which 49 %of second years and 45% of first years had knowledge about hypercementosis, but only 12%of first years and 13% of second years had knowledge about ectopic enamel. In a previous study, it

was found that the prevalence of developmental defects of enamel was about 29.9 % in children, so it is very important to be aware of the developmental defects (29).

Accessory roots may have an additional four to five roots than the normal count . Knowledge about accessory roots is very important while performing RCT's(Root Canal Treatment). In this study 91% of the population had knowledge of accessory roots(30).

Hypercementosis is a non neoplastic and idiopathic condition which is defined as the excessive buildup of cementum in the roots of a tooth. It may be present in one or more teeth (31). In our study, 94% participants were aware of hypercementosis . The root of a tooth may be slightly bent toward the mesial or distal . If the deviation is more than ninety degree it is known as dilaceration and if the deviation is less than ninety degree it is known as flexion(31,32).In this study about 83% were aware about flexion and 85% were aware about dilaceration.

Concrescence is a very rare occurrence. According to the previous studies, it was found that the frequency rate of occurrence of concrescence in Japan is about 0.32% and 0.02% in Caucasians and in India the rate of occurrence is very low (33). In this study, 3% were aware of concrescence and identified the image correctly . According to a review, the prevalence of enamel defects such as enamel hypoplasia, ectopic enamel varied from 4 to 60 % depending on the study population and criteria taken into consideration(2). Only 50 participants of this study were aware about ectopic enamel.

Anodontia are commonly misdiagnosed. Dentists should know the difference between real and pseudo anodontia. Anodontia can be truly diagnosed by oral and radiological exams (34). In this study only 7% of the population were about anodontia .Taurodontism is a rarely occurring anomaly due to the lack of constriction at the level of the cemento enamel junction (35) In this study, 19% of the participants had a depth knowledge on taurodontism. Hence, it is well known from this study that most of the participants had less knowledge about some developmental defects of teeth.

The study sample was small and constricted to a single college hence it is not the representation of the entire population. We can rectify and expand the study population and include many more questions to the questionnaire. There is a lack of knowledge about some development defects of teeth , so

experimental classes and interactive posters and seminars will help them to improve their knowledge about development defects of the oral cavity.

CONCLUSION:

Abnormal patterns of tooth eruption and tooth formation are known as developmental defects of teeth. Knowledge about developmental defects of teeth is very important while practising dentistry. It is very useful while diagnosing dental problems of the patients. Second year students were more aware of the developmental defects of teeth than the first years. Pictorial representation and theoretical sessions, can be included to enhance the knowledge of developmental defects among the students.

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CONFLICT OF INTEREST

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

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