

## Knowledge On Aesthetic Dentistry - A Survey Among Dental Undergraduates

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#### Abstract-

**Aim-**To assess the Knowledge and awareness of aesthetic dentistry among UG students

**Background-**Esthetic dentistry is generally used to refer to any dental procedure that improves the appearance (not necessarily the functionality) of teeth, gums and/or bite. It mainly focuses on improvement of the color, position, shape, size, alignment and the overall smile appearance.

**Materials and Methods-**This hospital based cross sectional study was conducted in a Private Dental College. Responses were collected from 100 UG dental students. The survey consisted of a questionnaire containing 15 questions and was circulated to the students through google forms. The statistical analysis; chi-square test was done using SPSS version 23. 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.

**Results-** In our study, females (47.06%) have more knowledge and awareness about dental aesthetics when compared to males (39.22%). This may be due to the fact that females are naturally more self-conscious. The association between gender and

awareness about aesthetic dentistry was evaluated by Pearson chi-square test and the p-value is 0.013 which is statistically significant.

**Conclusion**-The present study concluded that the UG dental students of Saveetha Dental College have an adequate knowledge and awareness regarding esthetic dentistry. In fact, females have an upper hand than males. This knowledge and awareness can be further improved by conducting workshops, Continuing Dental Education programmes, Social media, internet applications along with theory classes.

**Keywords:** Aesthetics, Bridges, Composites, Crowns, New technology, Smile and Veneers

## **Introduction**

Esthetic dentistry is generally used to refer to any dental procedure that improves the appearance (not necessarily the functionality) of teeth, gums and/or bite. It mainly focuses on improvement of the color, position, shape, size, alignment and the overall smile appearance. It is not a recognized specialty of dentistry but with functional and biological considerations, it represents one of the goals of dental treatment interventions, spanning areas like Prosthodontics, Orthodontics, Endodontics and Conservative Dentistry (1)(2)(3).

The quest to improve the appearance of the face and teeth dates back to ancient history (4)(5). Around 4000 years ago, in an Egyptian cemetery, a gold piece was found wrapped around 2 molar teeth which was used as a prosthetic device (crown/bridge). It was the 20th century that saw the most significant breakthroughs in aesthetic dentistry (6).

The understanding of natural tooth arrangements, positions, proportions, shapes, color is the foundation of aesthetic dentistry to mimic nature as closely as possible (7)(8). Tooth proportions, tooth-to-tooth proportions, tooth positioning, axial inclination, and arrangement are parameters that have been studied extensively under dental esthetics. Accurate treatment planning is crucial for ensuring that therapy achieves health, function and finally aesthetics (9).

The commonly used material for aesthetic restorations is dental ceramics, due to its color stability, biocompatibility, mechanical properties, and excellent aesthetic results. Aesthetic appearance and biocompatibility of ceramic crowns and bridges, their hardness, strength and other physicochemical attributes are very similar to natural teeth, making them almost ideal dental replacements (10)(11)(12). Porcelain veneers can allow for dramatic improvements for patients who have worn their teeth by bruxism (grinding of one's teeth through habit patterns) or fractured teeth (13)(14). Tooth whitening or tooth bleaching is the process of lightening the color of human teeth by changing the intrinsic or extrinsic enamel color (15)(16).

Gingivectomy is another esthetic procedure in which a small part of the gingiva is cut in order to get rid of a gummy smile and in case of deep calculus and tartar removal (17)(18)(19). Gum lift is done in case the buccal corridor is too wide (20). Braces with transparent ceramic brackets, transparent acrylic brackets, invisible aligners are gaining popularity due to their esthetic appeal. Sandwich restoration is one

of the best techniques as it causes Reduced post-operative sensitivity ,pulpal protection from irritation ,Fluoride release over time,prevention of demineralization and esthetics(21)(22).

Aesthetic dentistry lets you gain the perfect smile that you have in the reflection of your mind's eye. There are high-quality improvements in materials and strategies to offer greater natural solutions to get the best smile .Aesthetic dentistry procedures are becoming increasingly popular in day to day life of not just celebrities but even common people and span all specialities of dentistry, it is important to assess the awareness about these procedures among dental UG students. Our team has extensive knowledge and research experience that has translated into high quality publications (23-42). The objective of the study was to assess the knowledge and awareness amongst dental UG students on aesthetic dentistry.

### **Materials and Methods-**

A cross sectional study was conducted through an online survey from February to April 2021 among 150 undergraduates in a Private Dental College .A simple random sampling was used to select the study participants. All the dental students who were willing to participate were included. 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 was checked regularly for clarity, competence, consistency, accuracy and validity. Demographic details were also included in the questionnaire.Data was analysed with SPSS version (23.0). Descriptive statistics as percent were calculated to summarise qualitative data. 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

Table 1: SURVEY QUESTIONNAIRE

Serial no.	Questions	Options
1	Have you heard of esthetic dentistry?	Yes,No,Maybe
2	Have you met patients requiring esthetic procedures ?	Yes,No,Maybe
3	Do you think a lot of patients are conscious to have a perfect smile?	Yes,No,Maybe
4	Do you feel its important to schedule a smile evaluation for patients?	Yes,No,Maybe
5	Have you heard of the term golden proportion (1.618:1)?	Yes,No,Maybe
6	Do you think resin composites would be ideal for diastema closures?	Yes,No,Maybe
7	_____ is the application of tooth-colored composite resin directly to the tooth and then hardened using a curing light.	Tooth Bonding,Glass Ionomers,Veneers
8	Which restorative material has maximum application in todays times due to its esthetic properties and strengths?	Resin Composites,Glass Ionomers
9	Which of the following can not be used as inorganic fillers?	Glass,Quartz,Silica,Plastic
10	Which of the following restorative materials release flouride on setting?	Resin Composites,Glass Ionomer
11	Porcelain combines strength,translucence and the ability to match natural tooth color.	True,False
12	Which material can best be used for anterior teeth restorations as anterior teeth need to be more aesthetic than posterior teeth?	Porcelain veneers,Metals
13	Which picture of the 2 do you think follows the ideal teeth proportion?	A,B
14	Do you think (thin upper lip)1 is less aesthetic to (fuller upper lip)2?	Yes,No,Maybe
15	Many dental professionals who work in restorative dentistry feel that the sandwich technique provides a stronger filling, because the glass ionomer cement that is layered on first bonds to the tooth structure below and the composite to follow, offering a better seal and increasing filling retention.	True,False

**Results-**

In this study It was observed that ,57% of the participants were females and 43% of the participants were males.It was also observed that 92% of the participants out of which 52% were females and 40% were males ,could identify that the sandwich technique provides a stronger filling.

It was observed in our study that Majority (89.22%) of the participants were aware of aesthetic dentistry,6.86% were not aware and 3.92% of them were not sure if they had heard of aesthetic dentistry before (**figure1**). Majority (60.8%) of the participants had met patients requiring esthetic procedures,31.4% of them had not and 7.8% of them were not sure if they did (**figure2**). It was observed that Majority (65.7%) of the participants thought it's important to schedule a smile evaluation for patients,20.6% of them did not and 13.7% of them were not sure if a lot of patients are conscious of having a perfect smile (**figure3**). In our study It was observed that Majority (65.7%) of the participants thought it's important to schedule a smile evaluation for patients,20.6% of them did not and 13.7% of them were not sure if a lot of patients are conscious of having a perfect smile(**figure4**). It was observed that Majority (57.8%) of the participants have heard of the golden proportion,23.5% of them have not and 18.6% of them were not sure if they heard of it (**figure5**) . Majority (65.7%) of the participants thought resin composites were ideal for diastema closure,15.7% of them didn't think so and 18.6% of them were not

sure if resin composites were ideal for diastema closures (**figure6**). Majority (66.7%) of the participants thought tooth bonding is the application of tooth colored composite resin directly to the tooth and then hardened using a curing light,24.5% of them thought it was glass ionomer and 8.8% of them thought the answer was veneers (**figure7**). Majority (55.9%) of the participants think that resin composites have maximum applications in today's times due to its esthetic properties and strengths, 44.1% of them thought it was glass ionomer (**figure8**). Majority (42.2%) of the participants think plastic can not be used as inorganic fillers,21.6% of them thought it was glass,19.6% thought it was quartz and 16.7% thought it was silica (**figure9**). Majority (57.8%) of the participants thought glass ionomers release fluoride on setting,42.2% of them thought it was resin Composites (**figure10**). Majority (82.4%) of the participants think that porcelain combines strength,translucence and the ability to match natural tooth colour,17.6% of them thought it was a false statement (**figure11**). Majority (87.3%) of the participants think that porcelain veneers can be used for anterior teeth restorations instead of metals as they need to be more aesthetic while 12.7% of them thought metal veneers were a better option for anterior teeth restorations(**figure12**). Majority (65.7%) of the participants think that a fuller upper lip looks aesthetic , 20.6% of them think a thinner upper lip looks aesthetic while 13.7% of the participants were not sure (**figure13**). In our study the bar graph depicts the association between gender and knowledge on aesthetic dentistry where it was observed that Majority of the female students have a better knowledge of the knowledge of the golden ratio.Pearson Chi-square test was done, p value: 0.013(<0.05) hence statistically significant (**figure14**). In our study the bar graph depicts the association between gender and awareness of the golden ratio where it was observed that Majority of the female students have a better knowledge of the knowledge of the golden ratio.Pearson Chi-square test was done, Pearson Chi-square value- 2.192,df:2,p value: 0.032(<0.05) hence statistically not significant (**figure15**). our study the bar graph depicts the association between gender and knowledge on anterior teeth restorations where it was observed that Majority of the female students have a better knowledge of the knowledge on anterior teeth restorations .Pearson Chi-square test was done, Pearson Chi-square value-1.133,df:1,p value: 0.004(<0.05) hence statistically it is significant (**figure16**).

The association between the gender and response for the question regarding epithelial tissue was evaluated using pearson chi-square test and the results were tabulated as bar graphs with a p-value of 0.398. Hence, it is statistically not significant.

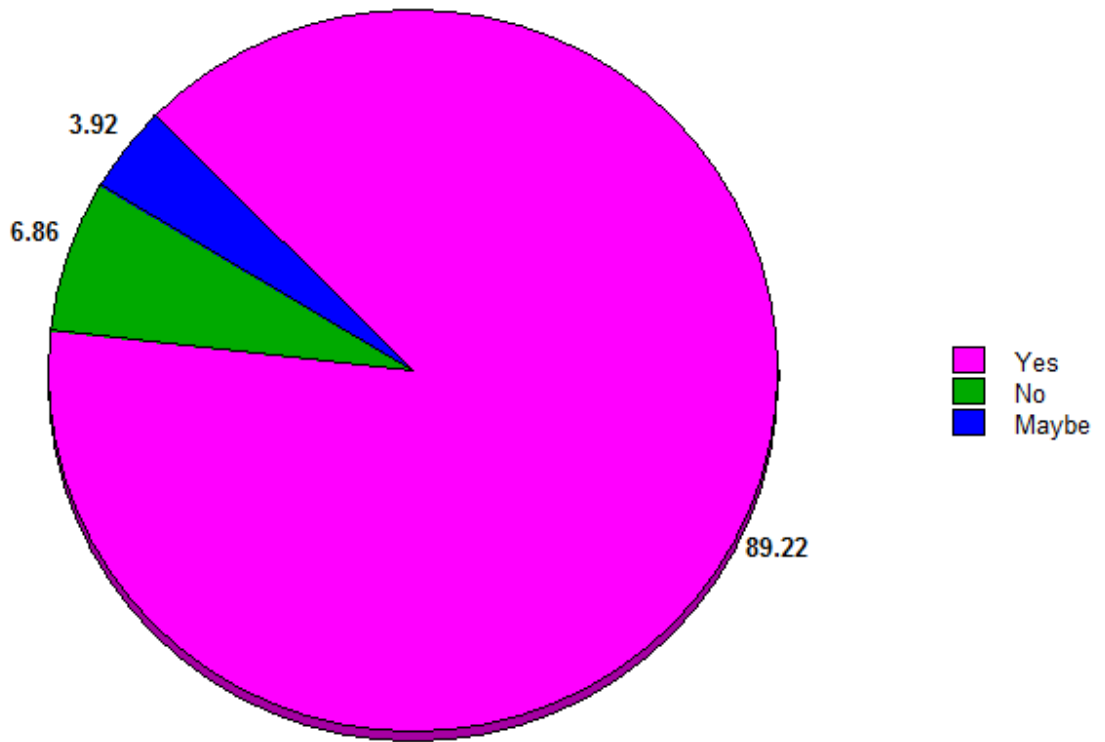


Figure1 shows the percentage of response of the participants who had an idea of aesthetic dentistry . Pink indicates “Yes”, Blue indicates “Maybe” and green indicates “No”. Majority (89.22%) of the participants were aware of it, 6.86% were not aware and 3.92% of them were not sure if they did.

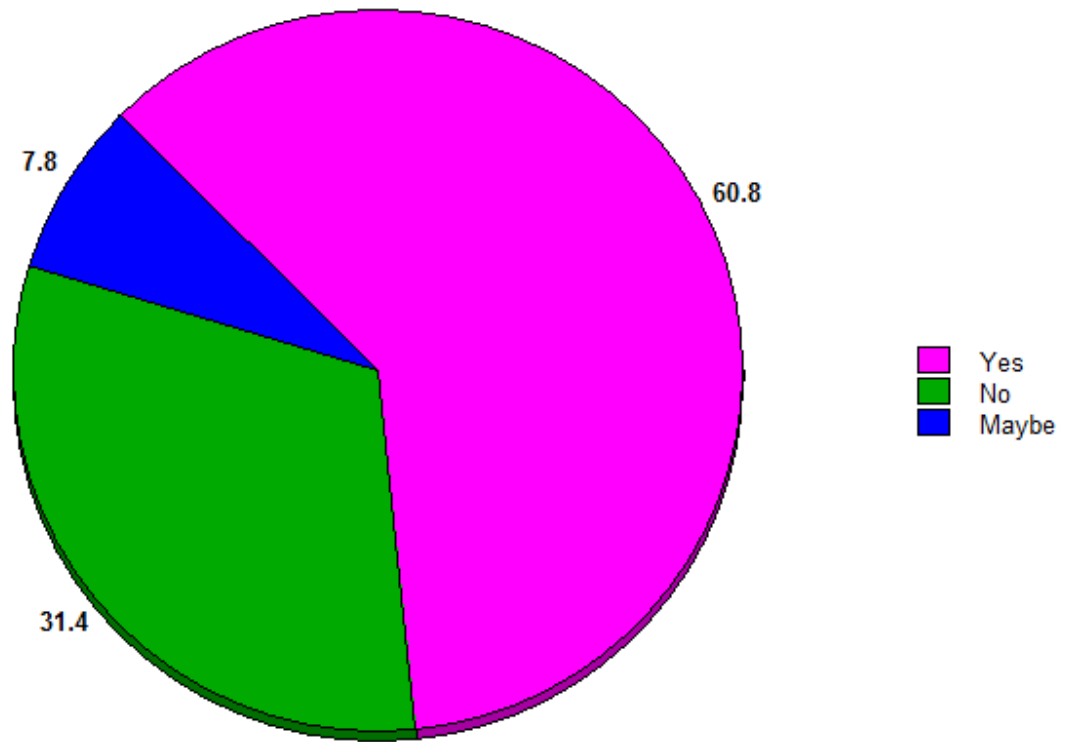


Figure2 shows the percentage of response of the participants who have met patients with aesthetic procedures . Pink indicates "Yes", Blue indicates "Maybe" and green indicates "No".Majority (60.8%) of the participants had met patients requiring esthetic procedures,31.4% of them had not and 7.8% of them were not sure if they did.

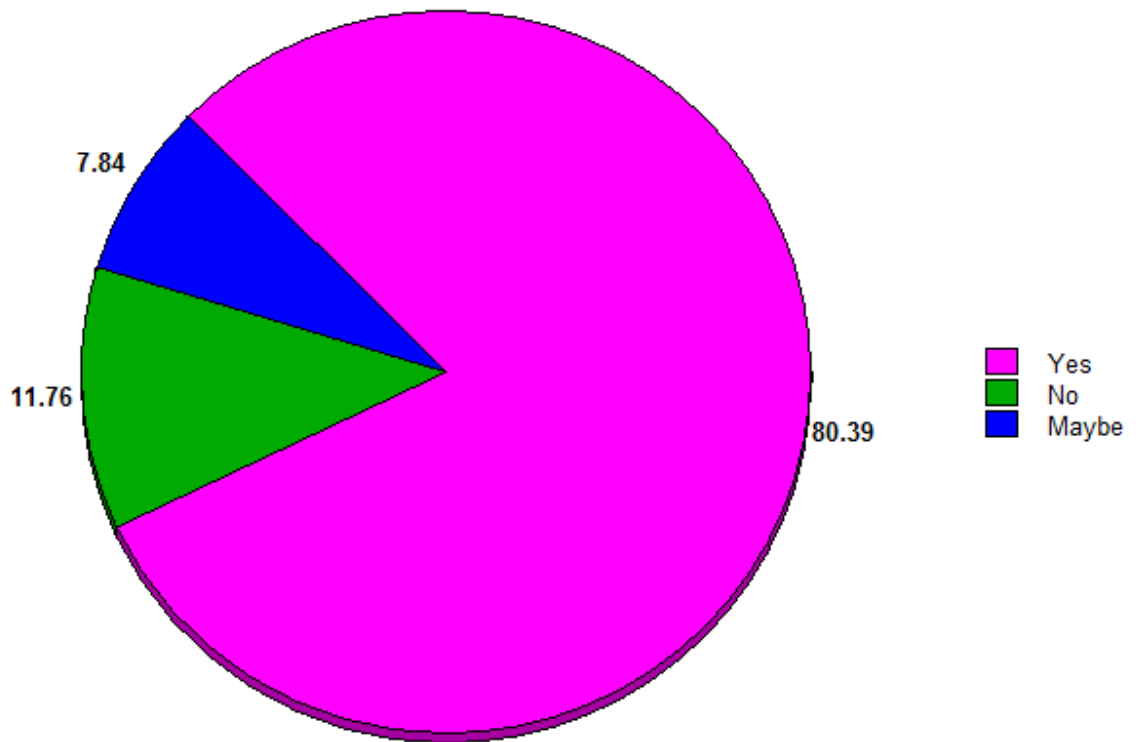


Figure3 shows the percentage of responses of the participants who think that a lot of patients are conscious of having a perfect smile. Pink indicates “Yes”, Blue indicates “Maybe” and green indicates “No”. Majority (80.4%) of the participants thought a lot of patients were conscious to have a perfect smile, 11.8% of them did not and 7.8% of them were not sure if a lot of patients were conscious to have a perfect smile.



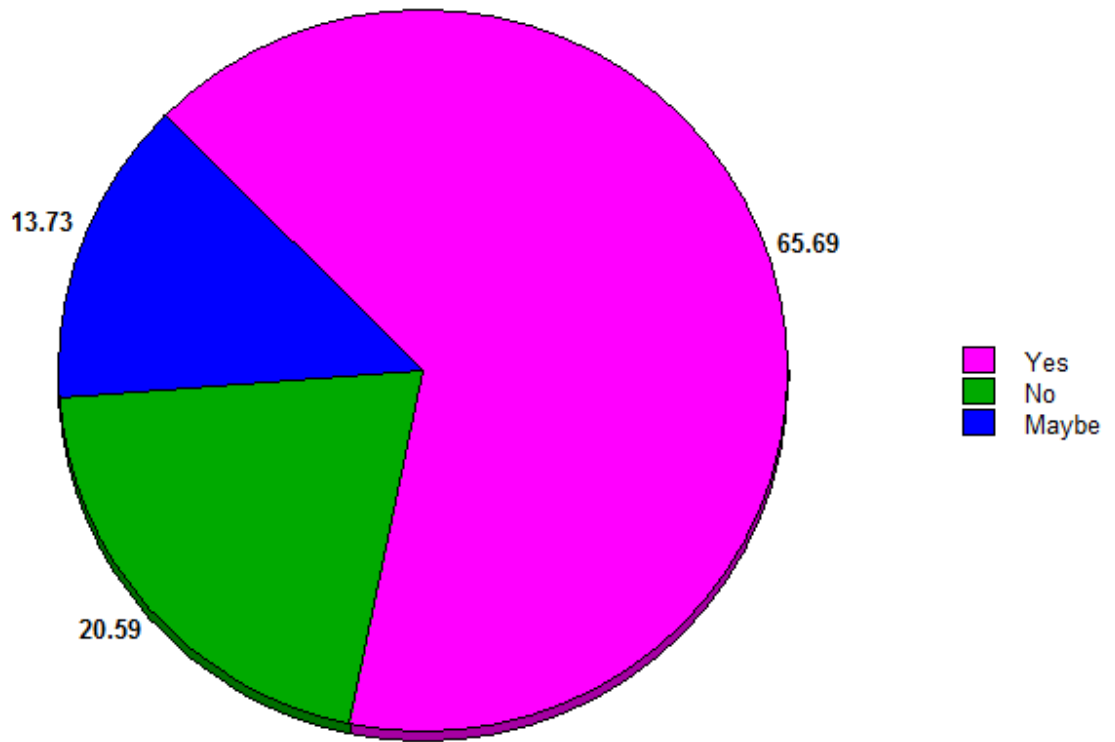


Figure4 shows the percentage of responses of the participants who thought that it's important to schedule a smile evaluation for patients. Pink indicates "Yes", Blue indicates "Maybe" and green indicates "No". Majority (65.7%) of the participants thought it's important to schedule a smile evaluation for patients,20.6% of them did not and 13.7% of them were not sure if a lot of patients are conscious to have a perfect smile.

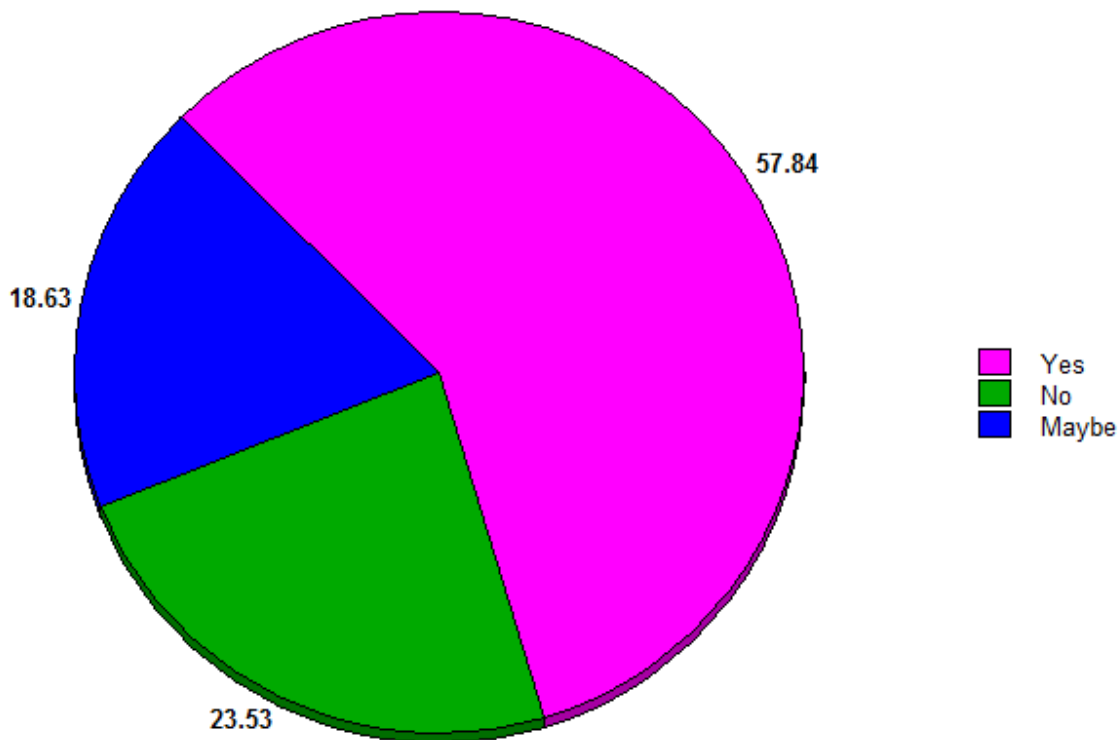


Figure5 shows the percentage of responses of the participants who had heard of the term golden proportion. Pink indicates "Yes", Blue indicates "Maybe" and green indicates "No". Majority (57.8%) of the participants have heard of the golden proportion, 23.5% of them have not and 18.6% of them were not sure if they heard of it.

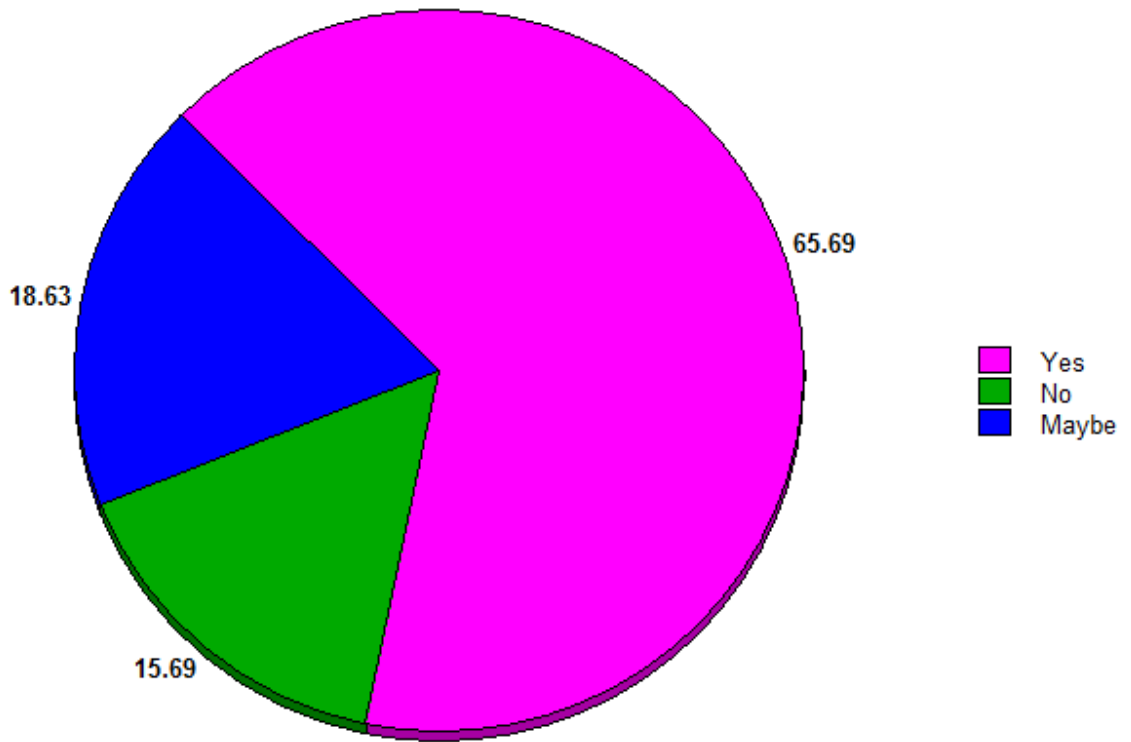


Figure6 shows the percentage of responses of the participants who thought resin composites were good for diastema closures .Pink indicates “Yes”, Blue indicates “Maybe” and green indicates “No”. Majority (65.7%) of the participants thought resin composites were ideal for diastema closure,15.7% of them didn't

think so and 18.6% of them were not sure if resin composites were ideal for diastema closures.

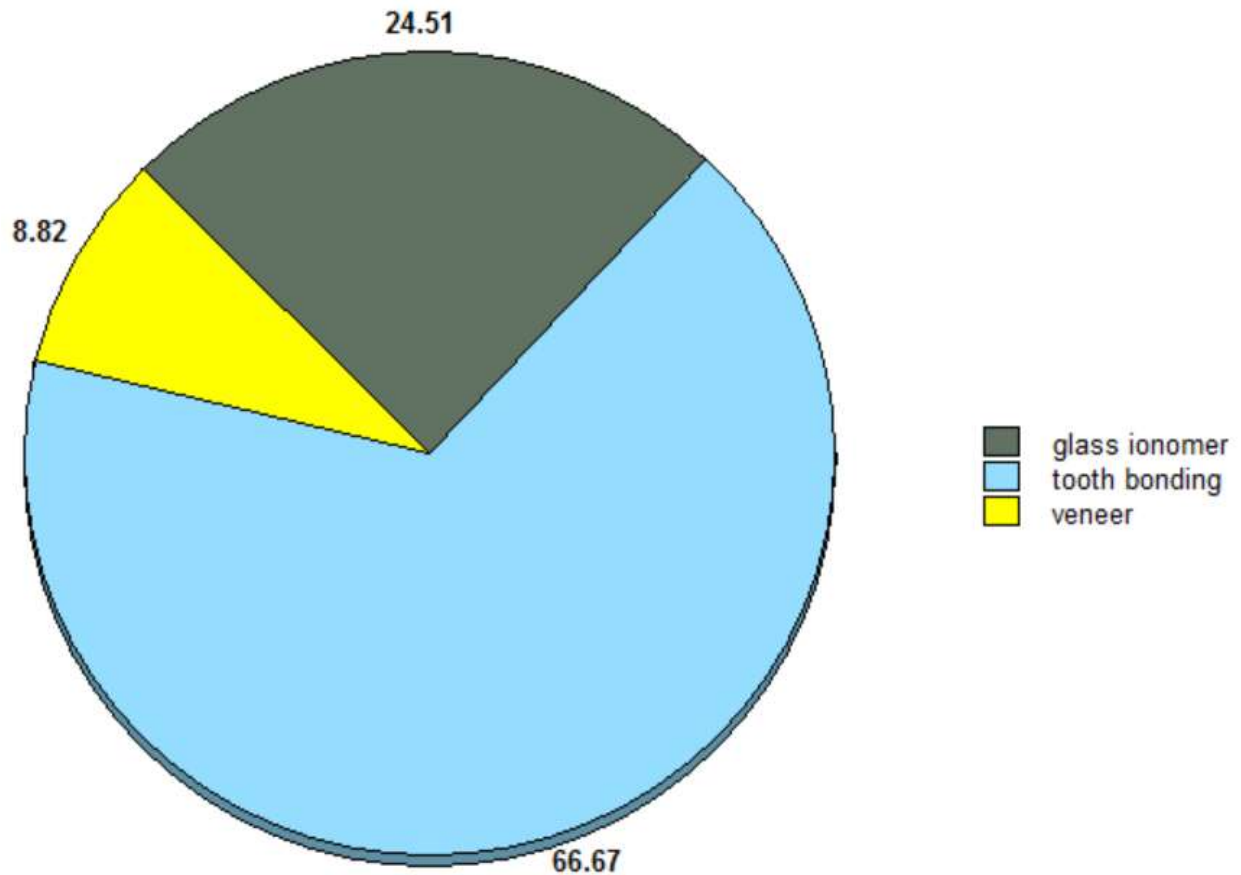


Figure7 shows the percentage of responses of the participants for tooth colored composite resin directly to the tooth and then hardened using a curing light. Yellow indicates “veneers”, Grey indicates “Glass ionomer” and light blue indicates “Tooth Bonding” . Majority (66.7%) of the participants thought tooth bonding is the application of tooth colored composite resin directly to the tooth and then hardened using a curing light, 24.5% of them thought it was glass ionomer and 8.8% of them thought the answer was veneers .

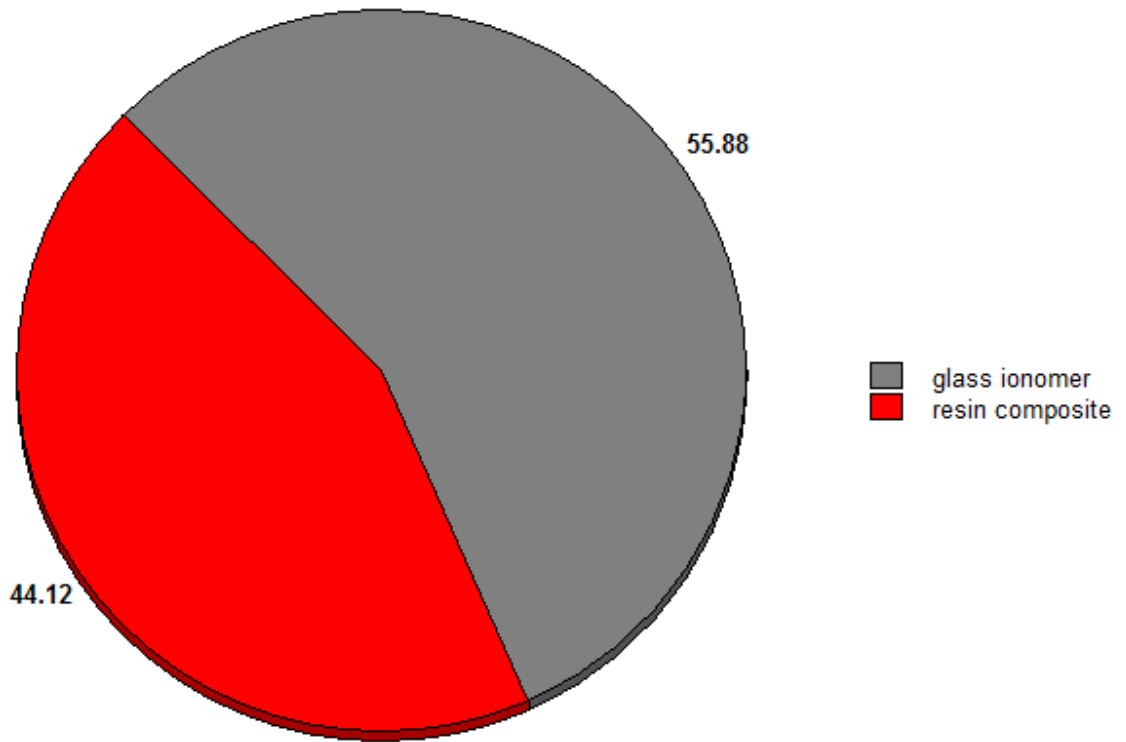


Figure8 shows the percentage of responses of the participants for the dental cement that has maximum applications in today's times. Majority (55.9%) of the participants think that resin composites have maximum applications in today's times due to its esthetic properties and strengths, 44.1% of them thought it was glass ionomer .Grey indicates glass ionomer and Red indicates resin composites .

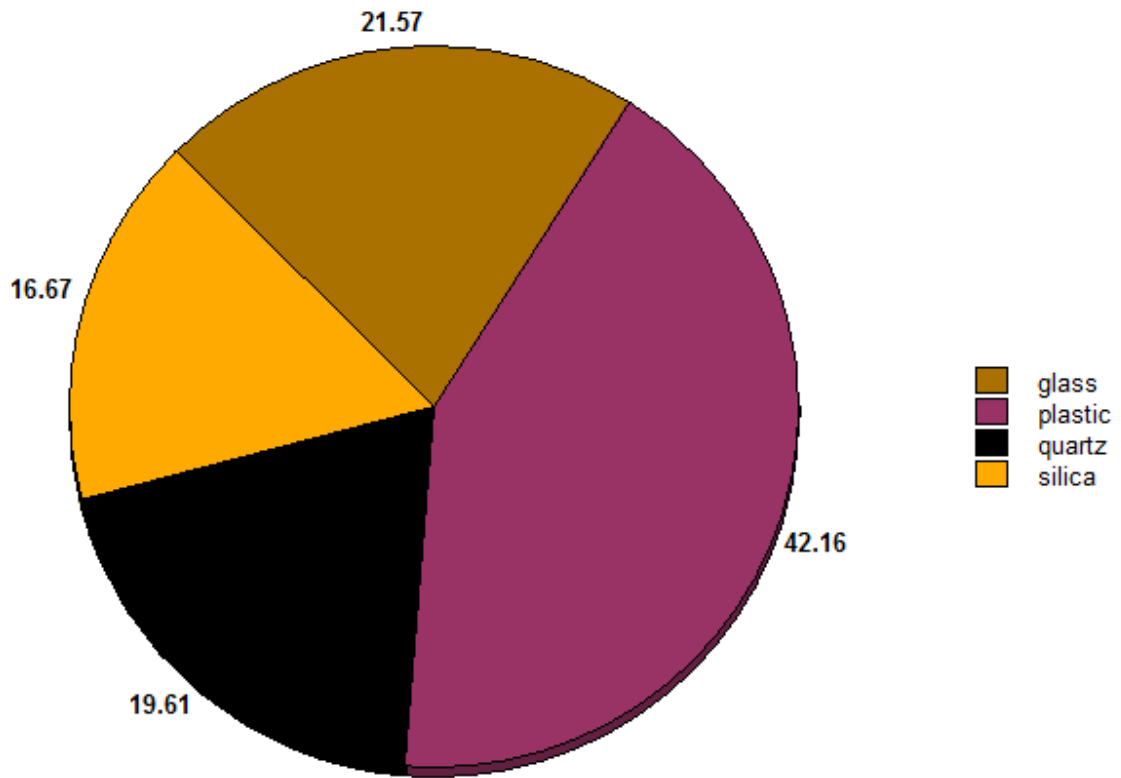


Figure 9 shows the percentage of responses of the participants for the dental material that cannot be used as inorganic fillers. Majority (42.2%) of the participants think plastic can not be used as inorganic fillers, 21.6% of them thought it was glass, 19.6% thought it was quartz and 16.7% thought it was silica. Brown indicates "Glass" ,Purple indicates "Plastic",Black indicates "Quartz" and orange indicates "Silica".

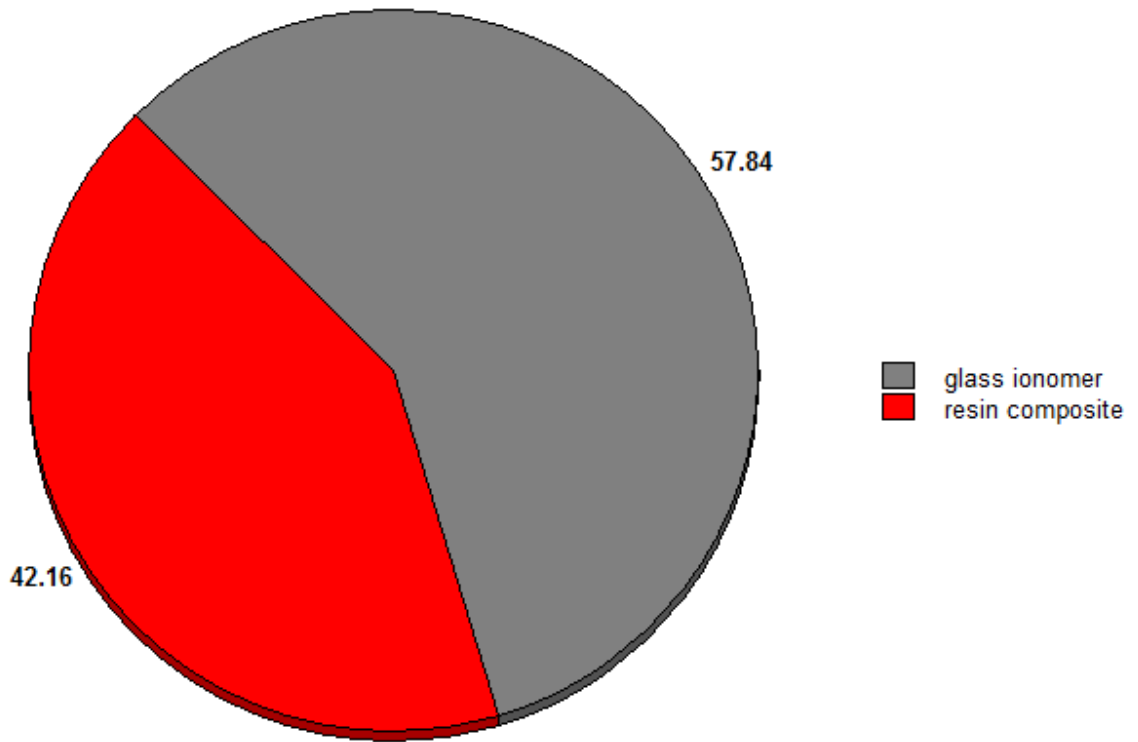


Figure10 shows the percentage of responses of the participants for restorative materials that release fluoride on setting. Grey indicates "Glass Ionomers" and Red indicates "Resin Composites". Majority (57.8%) of the participants thought glass ionomers release fluoride on setting, 42.2% of them thought it was resin Composites.

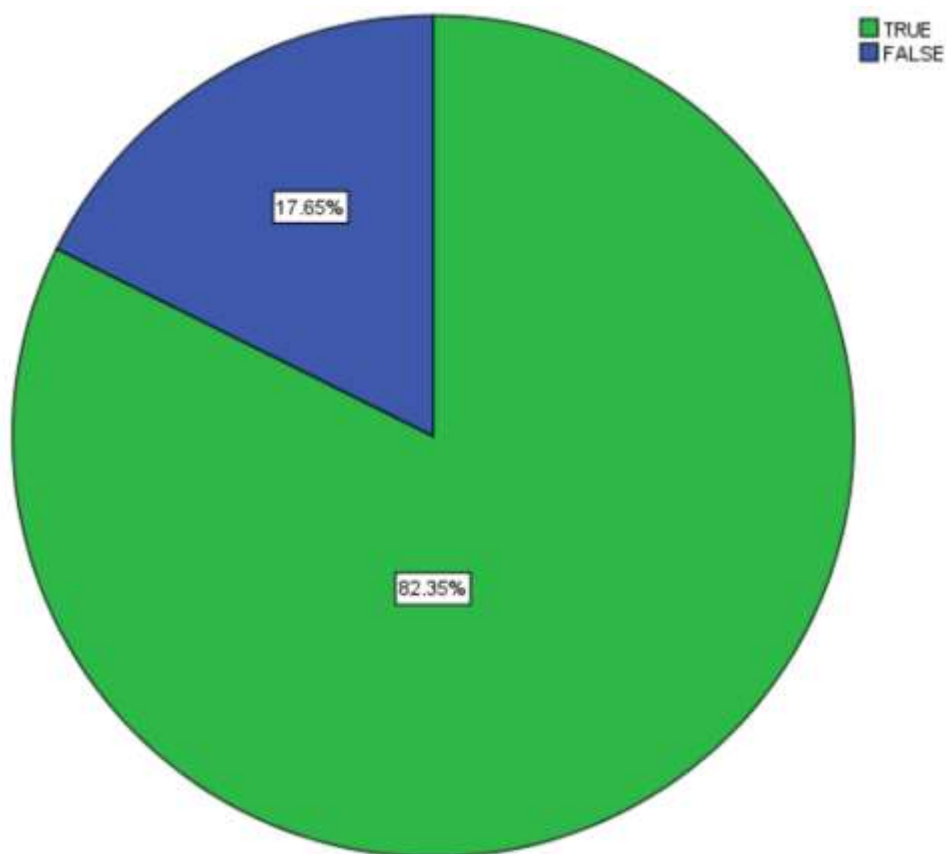


Figure11 shows the percentage of responses of the participants for the statement - “porcelain combines strength,translucence and the ability to match natural tooth colour”. Blue indicates “False” and dark green indicates “True”.Majority (82.4%) of the participants think that porcelain combines strength,translucence and the ability to match natural tooth colour,17.6% of them thought it was a false statement.



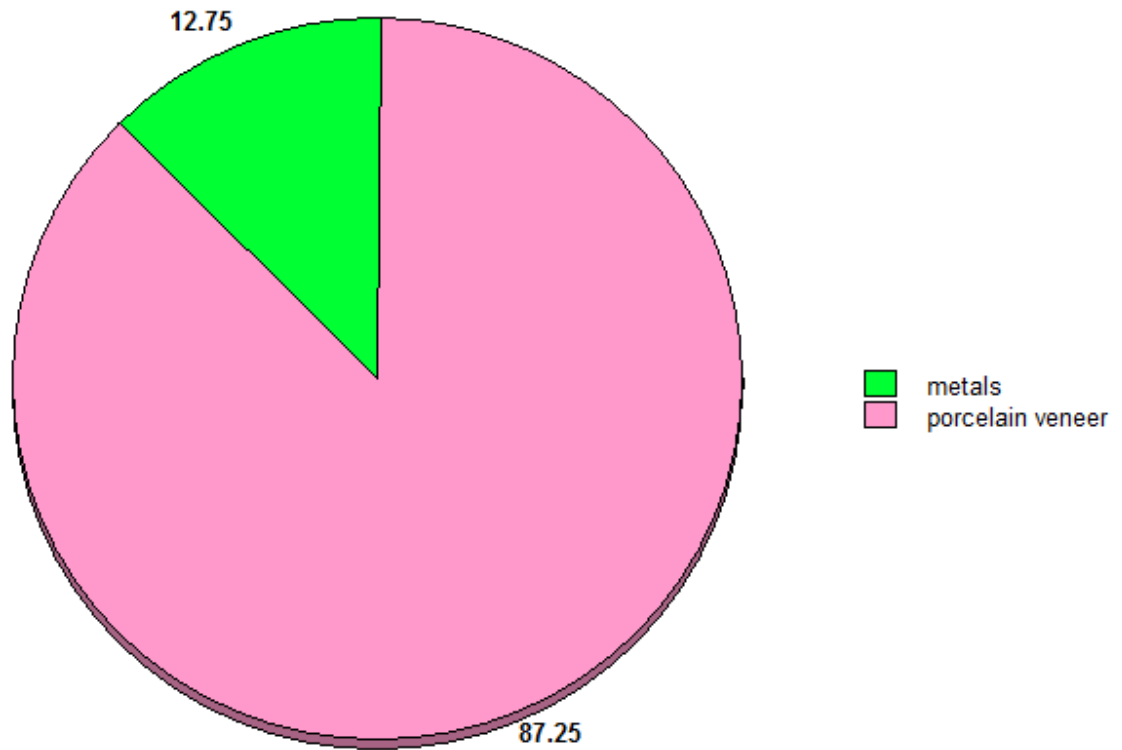


Figure12 shows the percentage of response of the participants for the material that suits anterior teeth restorations best. Lime green indicates "Metals" and Baby pink indicates "Porcelain Veneers". Majority (87.3%) of the participants think that porcelain veneers can be used for anterior teeth restorations instead of metals as they need to be more aesthetic while 12.7% of them thought metal veneers were a better option for anterior teeth restorations.

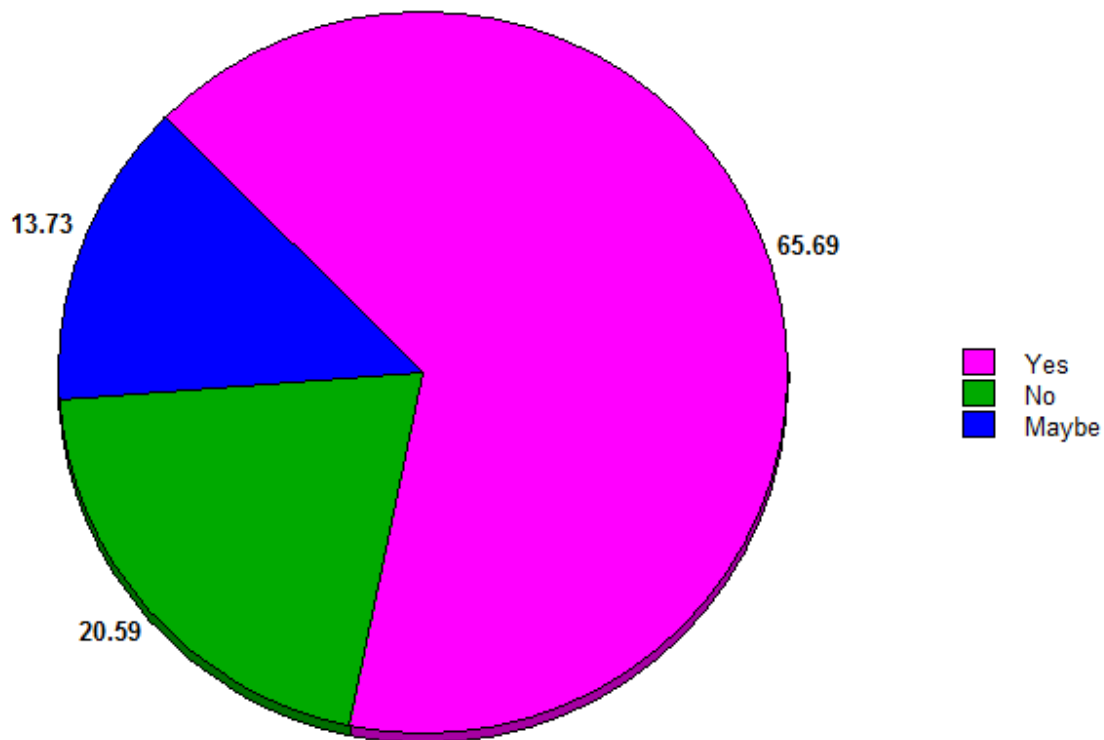


Figure13 shows the percentage of response of the participants for the question - whether a fuller upper lip is more aesthetic than a thinner upper lip. Pink indicates "Yes", Green indicates "No" and Blue indicates "Maybe". Majority (65.7%) of the participants think that a fuller upper lip looks aesthetic, 20.6% of them though a thinner upper lip looks aesthetic while 13.7% of the participants were not sure .

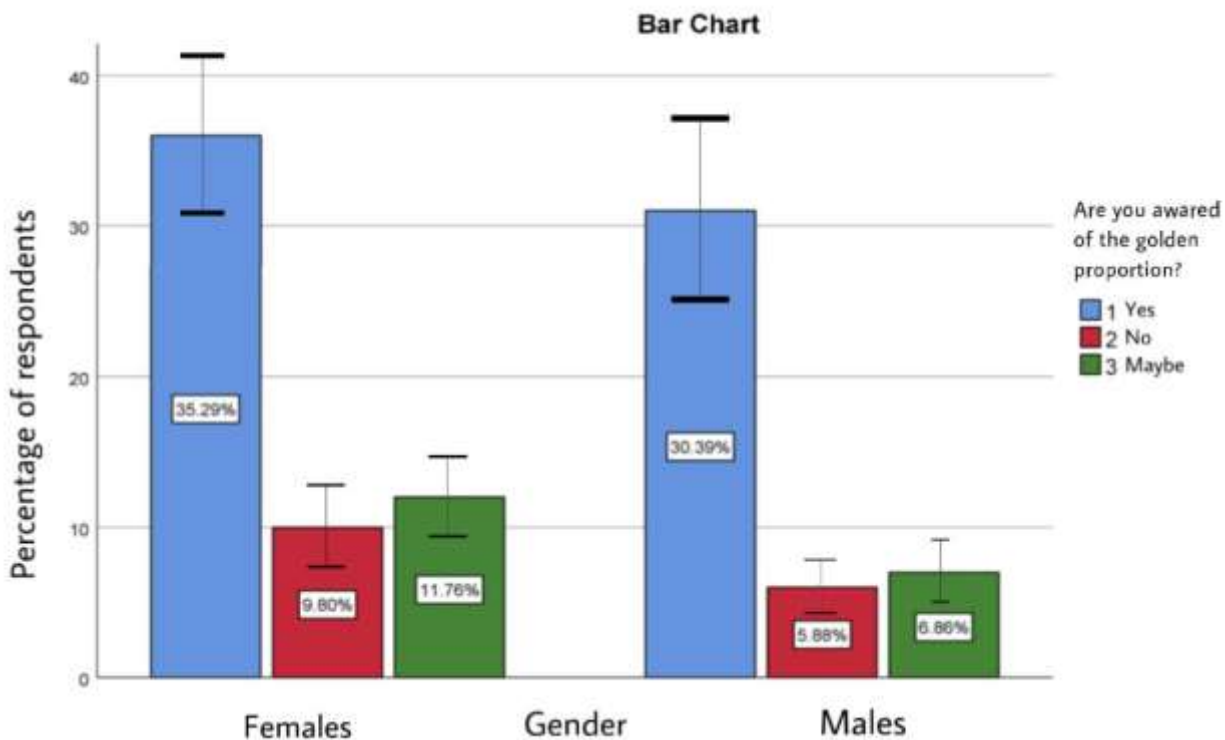


Figure14-The bar graph depicts the association between the gender and the knowledge regarding golden ratio. The X axis represents the gender and the Y axis represents the percentage of response of the participants. The Pink colour represents "Yes", Green colour represents "No" and Blue color represents "Maybe". Majority of the female students have a better knowledge of the knowledge of the golden ratio. Pearson Chi-square test was done, Pearson Chi-square value-2.192, df:2, p value: 0.032 (<0.05) hence statistically significant. There is a statistical significance between the gender and the knowledge of the golden ratio.

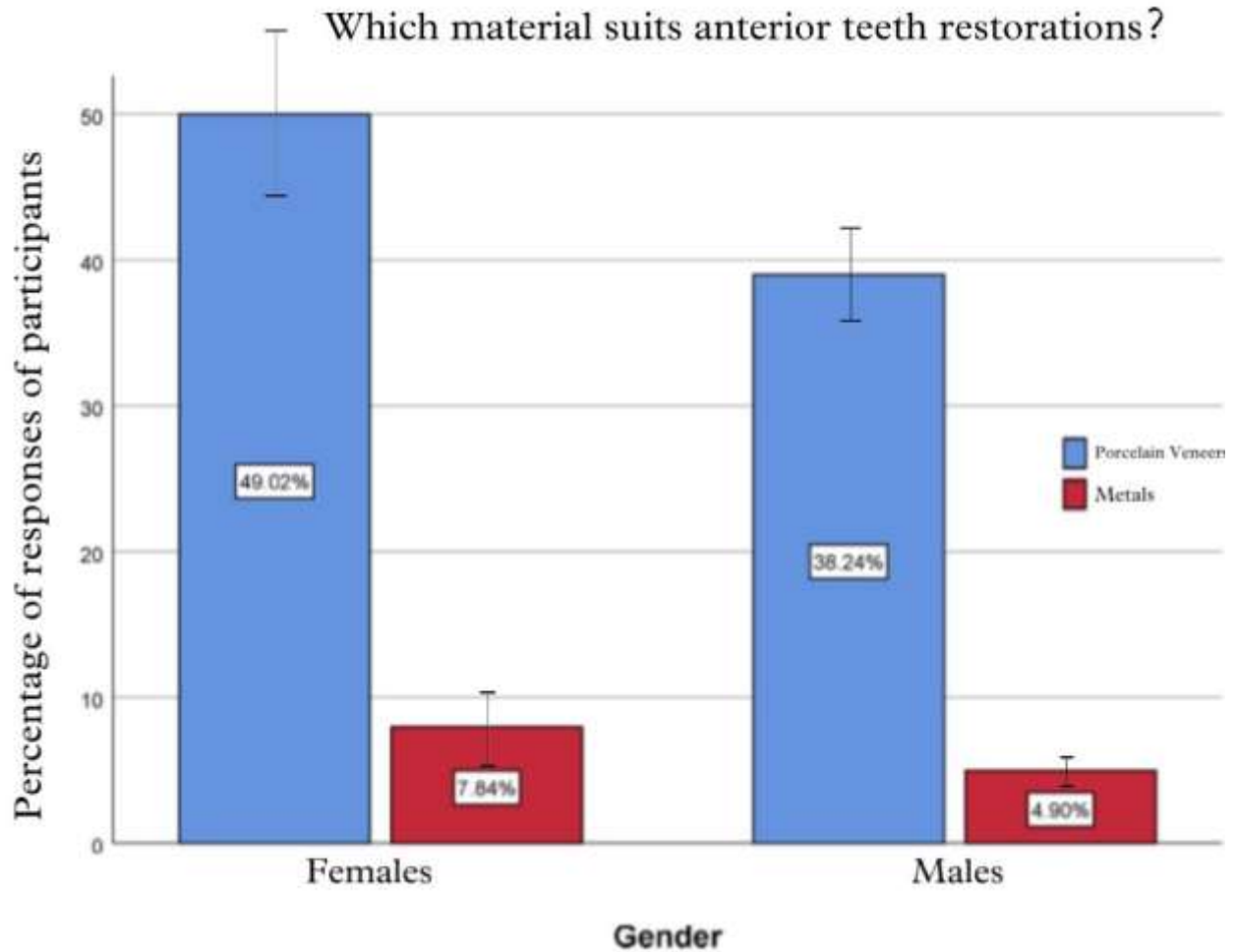


Figure15-The bar graph depicts the association between the gender and the anterior teeth restorations .The X axis represents the gender and the Y axis represents the percentage of response of the participants.The Blue colour represents "Porcelain veneers "and Red color represents "Metals" .Majority of the female students have a better knowledge of the knowledge on anterior teeth restorations .Pearson Chi-square test was done, Pearson Chi-square value-1.133,df:1,p value: 0.004(<0.05) hence statistically it is significant. There is a statistical significance between the gender and the knowledge on anterior teeth restorations.

#### Discussion-

It is observed that knowledge among females is more compared to males. Women are more beauty conscious compared to Men. One of the most important features of the face is the smile. Hence, Females focus a lot on smile improvement and are aware about different aesthetic procedures for smile improvement. It was observed sandwich technique offers better wear and tear resistance and is a successful restorative dentistry filling. In both open and closed sandwich techniques, the different materials of the composite resin is “stacked” onto the tooth, similar to building the layers of a sandwich. Similarly in our study it has been observed that 91.1% of the participants out of which 52 are females and 40 are males, think that sandwich technique provides a stronger filling offering better seal and increased filler retention.

It was previously observed by composite repair may be suitable for diastema closure and recon touring restorations. They are prepared by free radical polymerization, which in modern materials is visible-light initiated. On similar lines, it was observed that 65.7% of the students think resin composites would be ideal for diastema closures.

It was found that porcelain veneers are low maintenance, cause little enameloplasty, prevent teeth discoloration and are hence increasing in popularity amongst today’s dental practitioners. This was in congruence to the results of this study where 87.3% of the participants could identify the suitability of porcelain veneers for anterior teeth restorations as anterior teeth need to be more esthetic than posterior teeth.

Similar to past findings it is seen that lip augmentation is becoming popular as fuller upper lips are perceived as more beautiful to the eye in comparison to a protruded and thinner upper lip. This is in consensus to the study results where retrusive and thinner upper lip is esthetically unappealing to 65.7% of the participants in comparison to a fuller lip.

In a previous finding, glass ionomer cement is a versatile material and the pattern of fluoride release is characterised by an initial rapid release of appreciable amounts of fluoride, followed by a taper in the release rate over time (43)(44)(45)(46). On similar lines, 57.8% of the participants correctly feel that glass ionomers release fluoride on setting.

In our study, 65.7% of the participants feel it is important to schedule a smile evaluation for patients. The smile may be horizontally divided into teeth element and non-teeth element (buccal corridor). An ideal smile presents a larger teeth element and a smaller non-teeth portion. Similar results were obtained in which we could observe the importance of smile evaluation for detection of dental dysmorphia.

The Limitation of our study was that it was conducted on a small population. In future we can conduct such studies on a larger population for better accuracy. (47)(48)(49)

CONCLUSION;

The present study concluded that the UG dental students of private Dental College have an adequate knowledge and awareness regarding esthetic dentistry among which females have more knowledge than males. This is attributed to the fact that females are more aware about esthetic procedures in dentistry. This knowledge and awareness can be further improved by conducting workshops, Continuing Dental Education, Social media, internet applications, etc.

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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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