

## Awareness On Dental Caries Among General Population - A Cross Sectional Survey

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### ABSTRACT-

**Aim:** The aim of this study is to analyse awareness on dental caries among the general population.

**Background:** A deterioration of the tooth enamel causes dental caries or cavities, more commonly known as tooth decay. This breakdown is caused by bacteria on the teeth breaking down foods and producing acid, which kills tooth enamel and causes tooth decay.

**Methods:** The study consists of an online survey comprising self prepared questionnaires. The study is based on a cross sectional survey and the participants were selected by simple random sampling. The data collected are the results were tabulated using pie charts and bar graphs.

**Results:** Nearly 95% of the general population were aware of the causes of dental caries and have some knowledge on the preventive measures of dental caries. Almost 30% were not aware of the fluoride gels and its advantageous effect on teeth. Both males and females have responded that all the measures are to be followed. The present study shows that males(25.96%) were more aware of the disease, causes and its preventive measures. Pearson chi square test shows p value is 0.003 (p<0.05) and thus it is statistically significant. In our study, 51.92% of males and only 18.27% of females were aware that dental caries cause tooth sensitivity. Pearson chi square test shows p value is 0.004 (p<0.05) and thus it is statistically significant.

**Conclusion:** It is concluded that males were more aware about dental caries than females. It is necessary to educate the general population through dental camps/ awareness programmes on the prevalence, treatment and management of Dental Caries.

**Keywords:** Acid, Dental caries, Diet, Enamel, Fluoride gels, Innovative technique.

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## **INTRODUCTION:**

People remain susceptible to the disease throughout their lifetime. Dental caries is one of the most common preventable diseases. This remains to be the primary cause for pain and tooth loss. At early stages, dental caries can be potentially arrested and reversed, but are often self limiting and without proper care. Caries can progress until the tooth is completely destroyed. Dental caries are a localised destruction of susceptible dental hard tissues by acidic by-products from bacterial fermentation of dietary carbohydrates (1). The signs of caries are seen on dental hard tissues, but the disease progress is initiated within bacterial biofilm. Dental caries is a multifactorial disease that can start with microbiological shifts within the complex biofilms and is affected by salivary flow composition. It is a chronic disease that progresses slowly in most people. It can be seen on both crown and roots, and on smooth surfaces as well as on fissured surfaces and pits of the tooth. The terms dental caries or caries is used to identify both the caries process and the curious lesions that are formed as a result of the process. Caries in the primary tooth of preschool children are commonly known as early childhood caries (2).

Dental caries are a major oral health related problem, highly prevalent in children because of the diet they consume. Frequent consumption of carbohydrates, dietary sugar; increase the risk of dental caries among children (3). Dental caries is a transmissible disease since it is due to a bacteria, the mutants of Streptococci. It cannot transmit from one tooth to another.

Remedies for dental caries are well known, a renewed campaign for water fluoridation, topical fluoride application, the use of fluoride rinses, proper brushing technique, a return to oral health educational school programmes (4). There are studies assessing the prevalence of dental caries among all age groups across the world and its effects on the lifestyle of the population (5-26). Thus, the aim of the present study is to analyse the prevalence of dental caries among the general population and create an awareness of the disease among them.

## **MATERIALS AND METHODS:**

### **STUDY DESIGN:**

A cross sectional study was conducted during the first week of February 2021, among the general population at Saveetha Dental College, velappanchavadi, Chennai.

**STUDY SUBJECTS:**

A simple random sampling was used to select the study participants. All the general population who were willing to participate were included for this study. They were approached by different recruitment strategies. Informed consent was collected from the respondents who agreed to participate in the 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:**

A self administered questionnaire with 10 questions was prepared and was circulated as online google survey forms in February 2021. Some questions were of yes/no type and the others were multiple choice questions. 104 responses were collected. The collected data were checked regularly for clarity, accuracy, and validity. Demographic details were also included in the questionnaire.

**ANALYSIS:**

At the end of the survey 104 responses were recorded. The responses were converted to Microsoft excel. The results were analysed using spss software (statistical packages of social sciences ) version 23.0 and the statistical test used for the analysis is chi square test.

**OUTCOME:**

Knowledge and awareness on dental caries among the general population.

**QUESTIONNAIRE**

S.No	Question	Option 1	Option 2	Option 3	Option 4
1	Age				
2	Gender	Male	Female		
3	How often do you visit a dentist?	6 months once	Once a year	Only during pain	

4	Have you already been to a dentist regarding dental caries?	Yes	No		
5	Have you undergone any filling for dental caries?	Yes	No		
6	What do you think is the major cause for dental caries?	Sweets	Improper brushing	Both	
7	What are the measures you take to prevent dental caries?	Proper brushing technique	Rinsing mouth after each meal	Flossing	All the above
8	What do you think is the best option for treating dental caries?	Filling the decayed tooth	Removal of decayed tooth		

9	Can dental caries be transmitted from one tooth to another?	Yes	No		
10	Do you think that dental caries cause tooth sensitivity?	Yes	No		
11	Do you think that dental caries cause swelling and tooth loss?	Yes	No	Maybe	
12	Have you heard about fluoride gels?	Yes	No		
13	Was this survey useful in creating awareness on dental caries?	Yes	No		

**RESULTS:**

The study states that 50% of the population do not follow regular check-ups with dentists (Figure 2). In the present study, 54.8% of the population already suffer from dental caries (Figure 3). 44.23% of the participants have already undergone filling for dental caries and 55.77% have not undergone any filling

(Figure 4). Among the study population, 31.73% have said that it is due to over consumption of sweets (Figure 5). Only 23.08% of the participants said proper brushing technique, 27.88% of the participants said rinsing mouth after each meal, 9.62% have opted flossing and 39.42% have opted all the above for measures taken to prevent dental caries (Figure 6) . The study population consisted of respondents of age ranging from 14 to 35 years among which the majority of the respondents belonged to the age of 18 to 20 years. According to the present study, older people mostly prefer extraction of teeth over treatment or filling of teeth (Figure 7). The study shows 63.5% are not aware that the disease is due to a bacterial biofilm, mutants of Streptococci (Figure 8). Majority, 50.96% of the participants were aware of the consequences of dental caries whereas 9.62% have opted no and 39.42% have opted maybe (Figure 9). Majority, 71.15% of the participants have opted yes for their opinion on dental caries causing tooth sensitivity and 28.85% are unaware (Figure 10). And there is also a marked increase in the prevalence of dental caries among the general population, that is, in both children and adults. People are quite aware of the causes, preventive measures, management and treatment of the disease. 28.8% are not aware of fluoride gels and their advantageous effects on reducing the risks of getting affected by dental caries (Figure 11). Compared to females, the majority of males have responded that all the measures are to be followed to prevent themselves from dental caries. Pearson chi square test shows p value is 0.003 ( $p < 0.05$ ) and thus it is statistically significant (Figure 12). Similarly, the majority of the male population have said that dental caries cause tooth sensitivity than females. Pearson chi square test shows p value is 0.004 ( $p < 0.05$ ) and thus it is statistically significant (Figure 13). Restoration of the decayed teeth is opted by the majority of the population, both males and females. Pearson chi square test shows p value is 0.003 ( $p < 0.05$ ) and thus it is statistically significant (Figure 14). Also the present study thus shows that males are more aware of the disease, causes and its preventive measures.

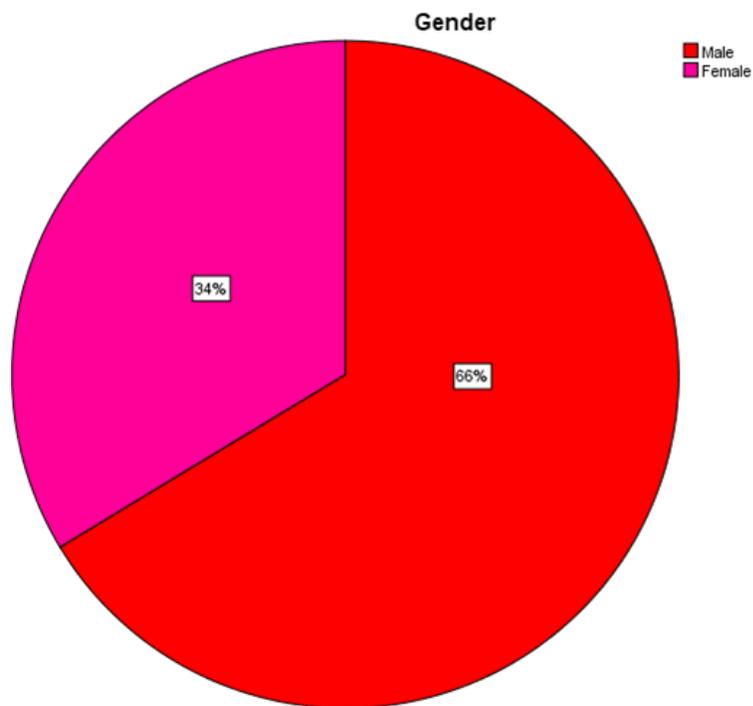


FIGURE 1: Shows the response of the gender distribution among the participants. Red indicates males and pink indicates females. Majority (66.3%) of the respondents were males and 33.7% were females.

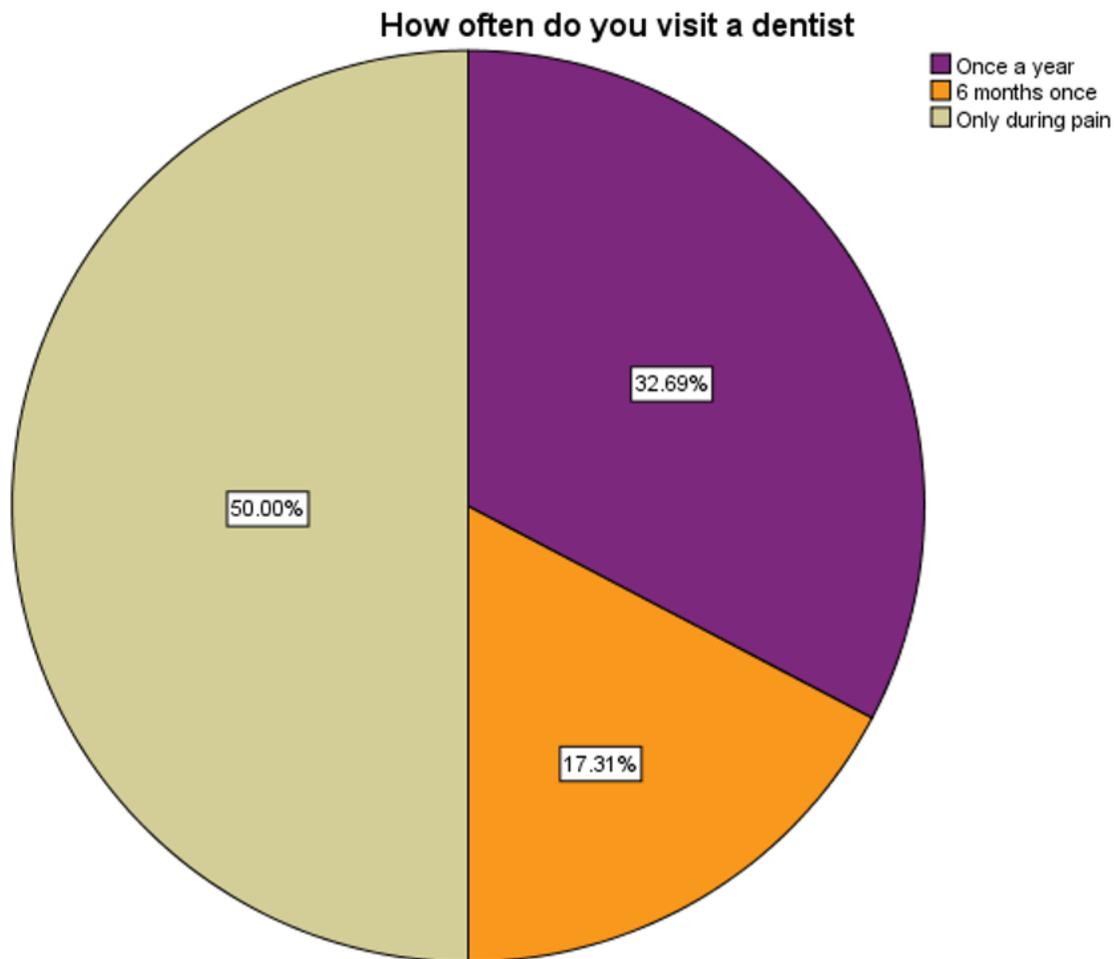


FIGURE 2: Shows the response of the frequency of population in visiting the dentist. Orange indicates 6 months once, purple indicates once a year and beige indicates only during pain. 17.31% of the respondents visited a dentist 6 months once, 32.69% of the participants visited a dentist once a year and majority (50%) of the participants only visited during pain.

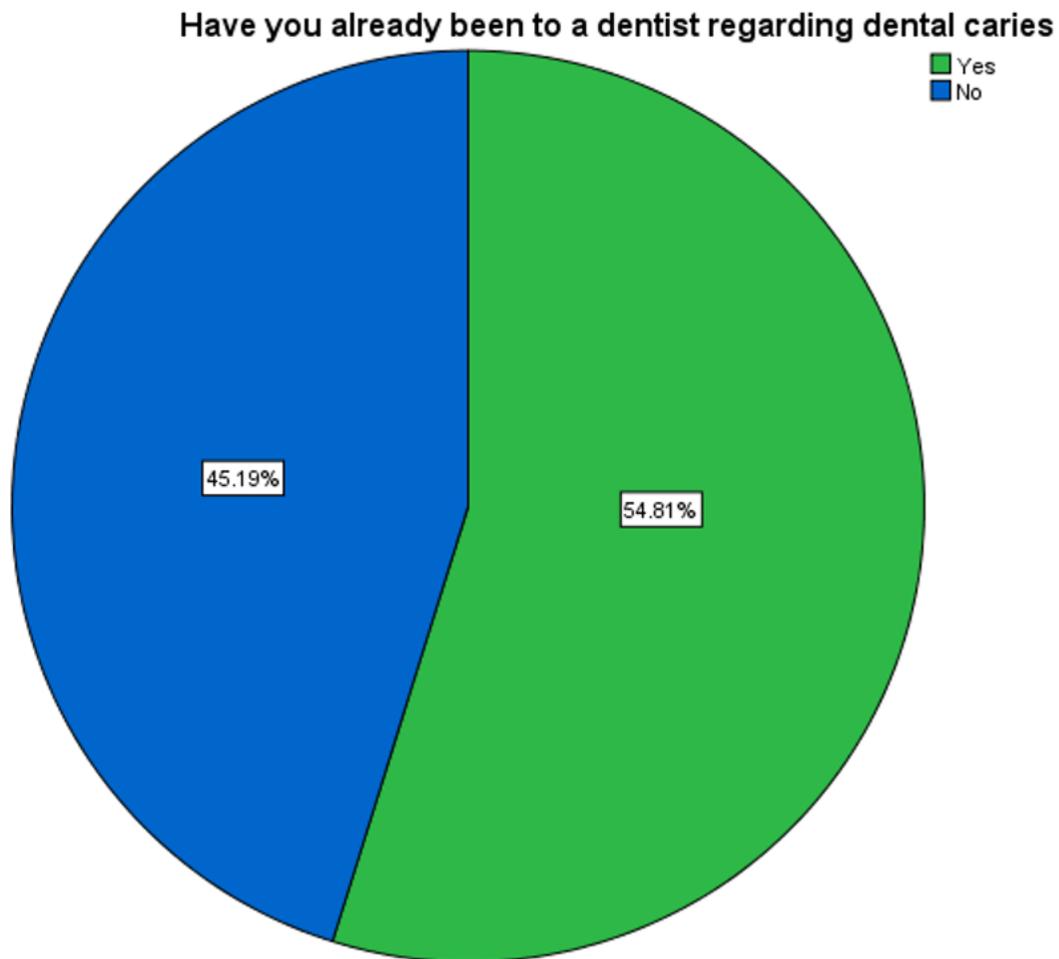


FIGURE 3: Shows the response of the frequency of the participants who have already visited a dentist regarding dental caries. Green indicates yes and blue indicates no. Majority (54.81%) of the participants have already been to the dentist regarding dental caries, and 45.19% have not been to the dentist regarding dental caries.

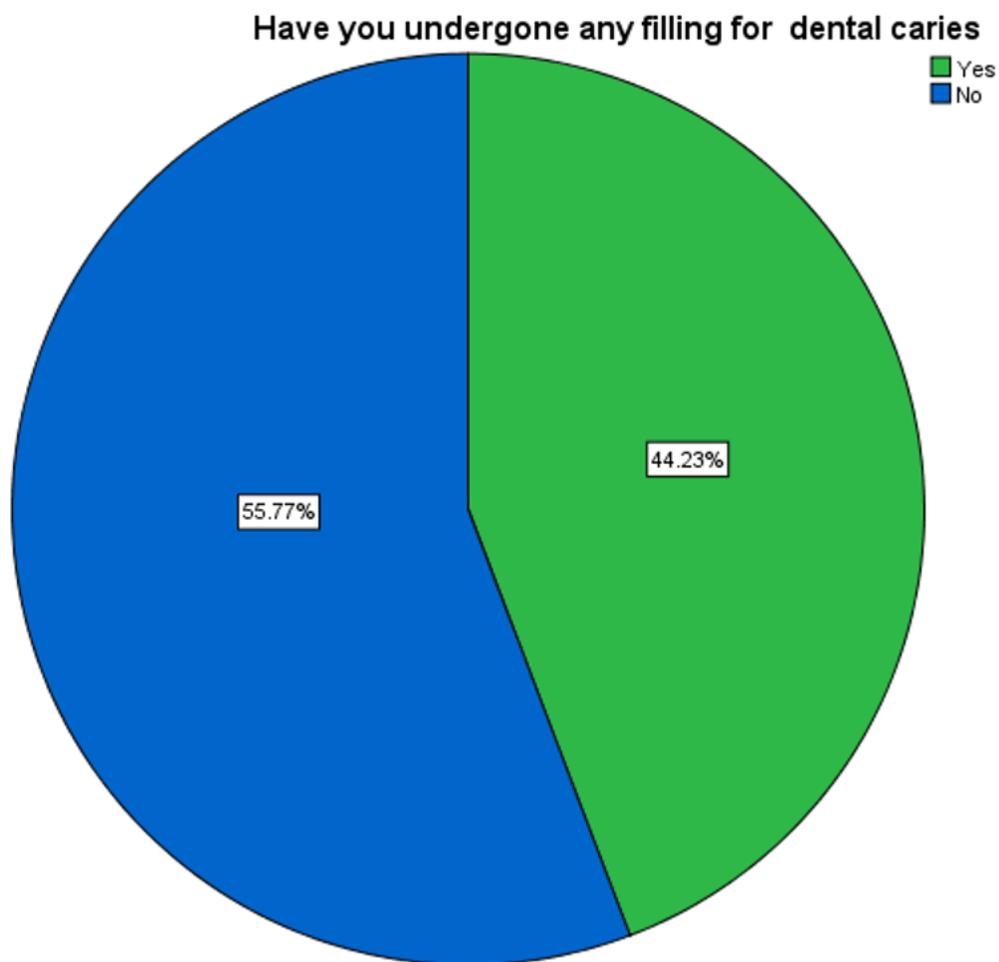


FIGURE 4: Shows the response for the participants for being undergone filling for dental caries. Green indicates yes and blue indicates no. 44.23% of the participants have already undergone filling for dental caries and 55.77% have not undergone any filling.

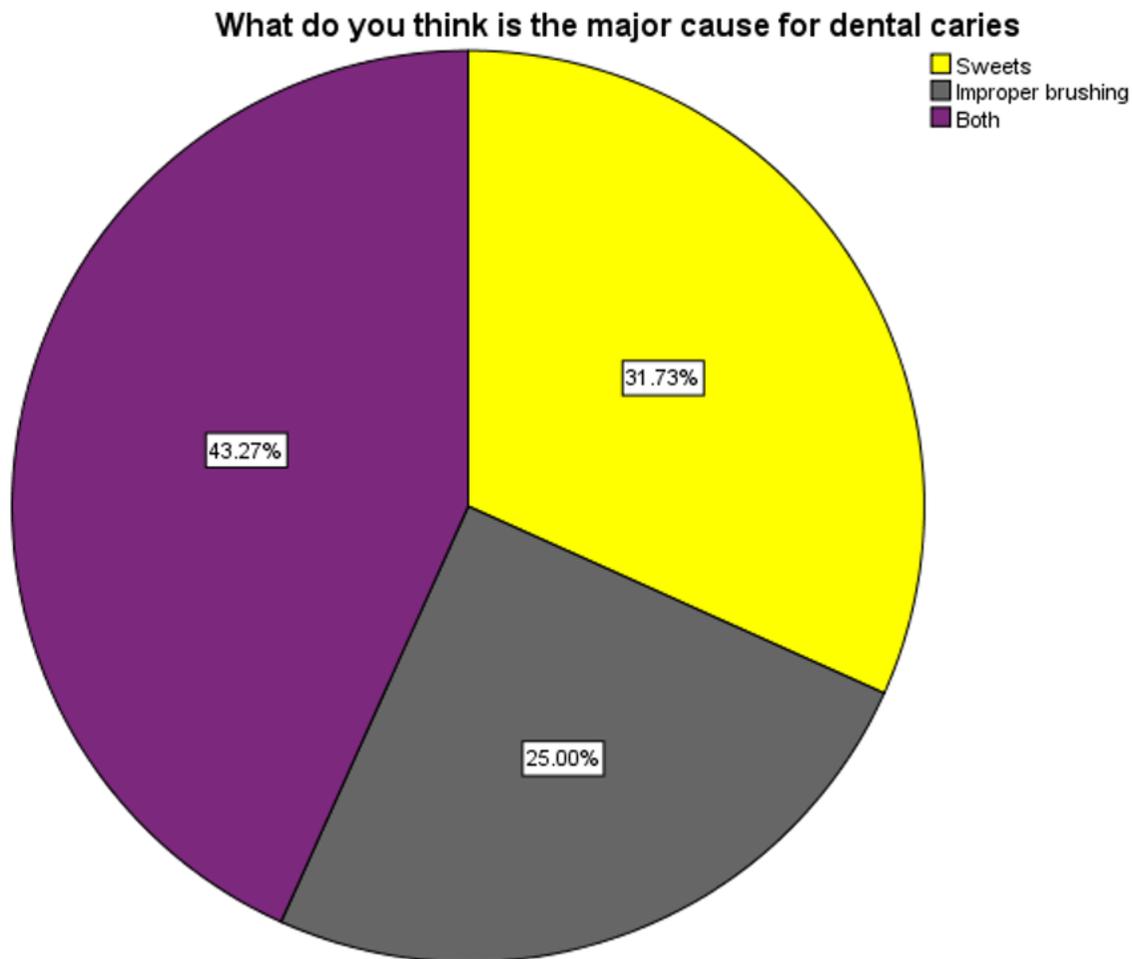


FIGURE 5: Shows the response for the knowledge on the major cause for dental caries. Grey indicates improper brushing, yellow indicates sweets and purple indicates both. Majority (43.27%) of the participants have opted for both whereas 25% and 31.73% were selected improper brushing and overconsumption of sweets respectively.

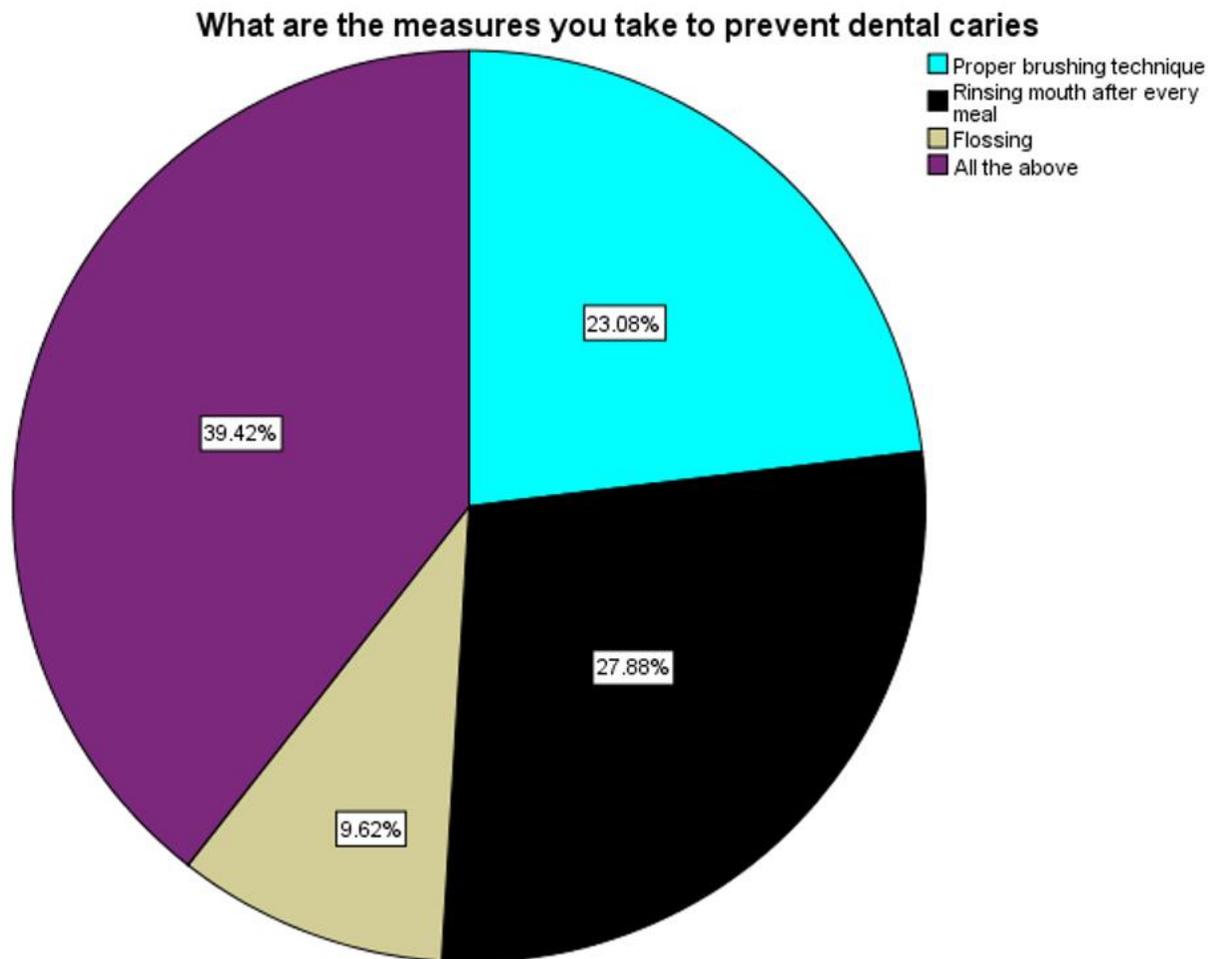


FIGURE 6: Shows the response for the knowledge on the preventive measures of dental caries. Blue indicates proper brushing technique, black indicates rinsing mouth after each meal, beige indicates flossing and magenta indicates all the above. Only 23.08% of the participants said proper brushing technique, 27.88% of the participants said rinsing mouth after each meal, 9.62% have opted flossing and 39.42% have opted all the above.

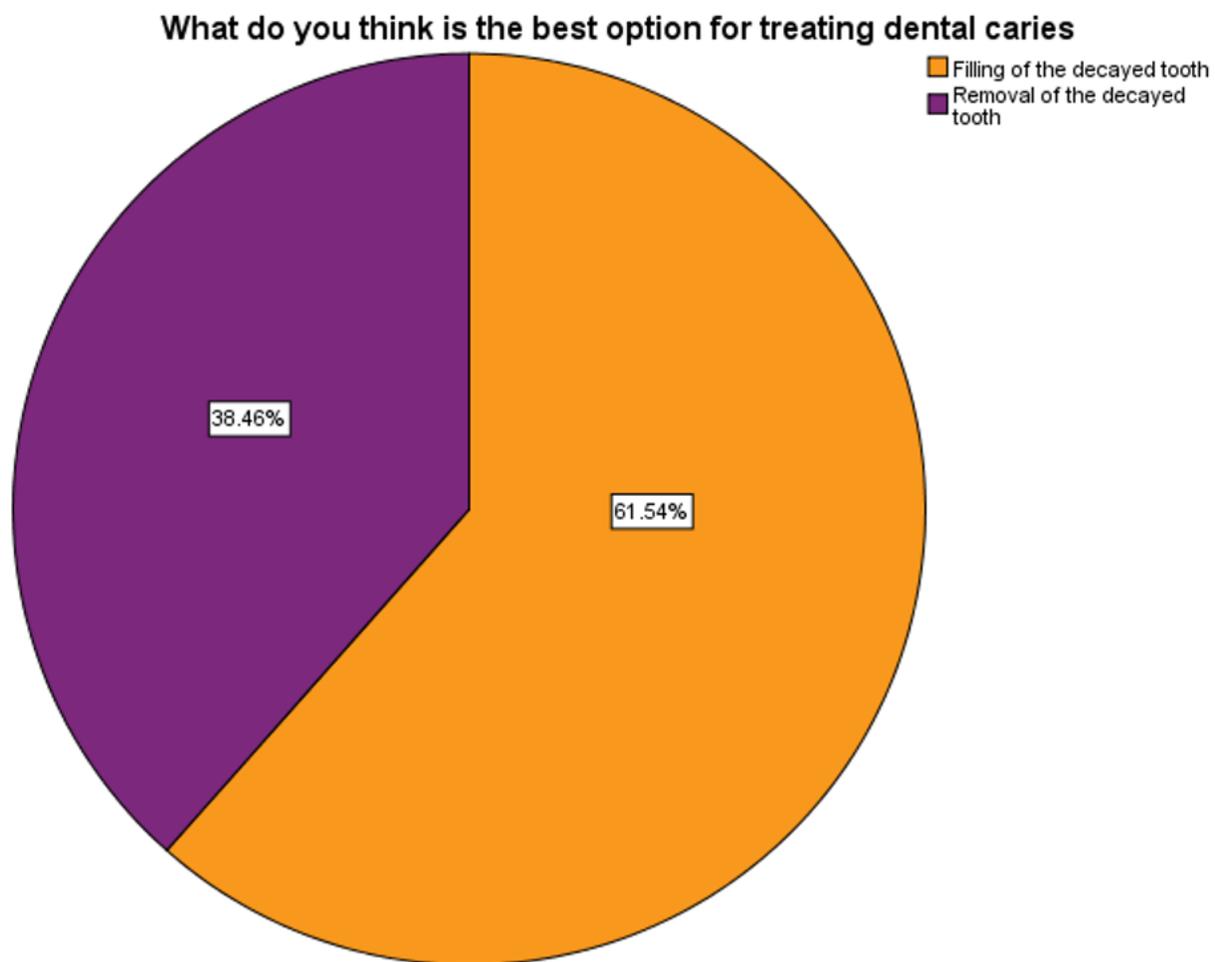


FIGURE 7: Shows the response for the participants on their opinion on treating or extraction of decayed teeth. Orange indicates filling of tooth and purple indicates extraction of tooth. Majority (61.54%) of the participants have opted to treat filling of the decayed tooth, 38.46% have opted for removal of the decayed tooth.

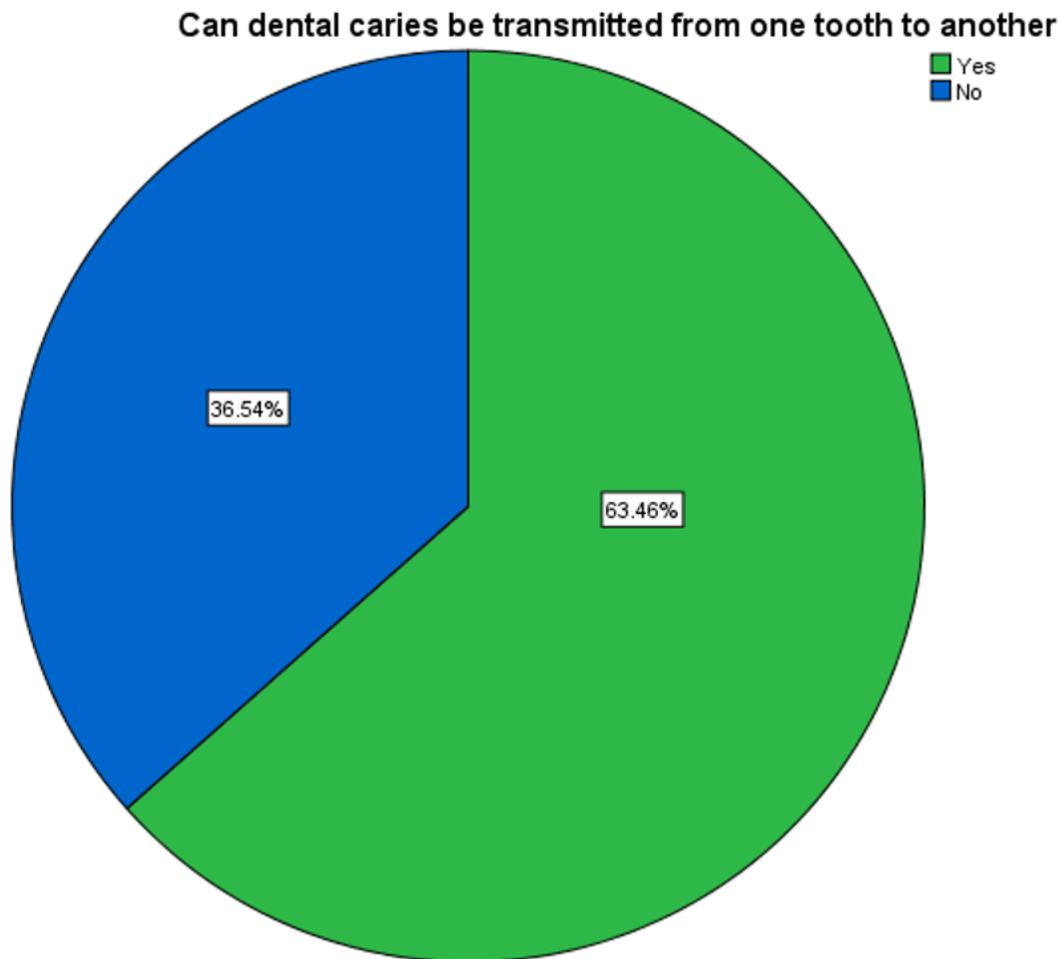


Figure 8: Shows the response of the participants about the spread of disease from one tooth to another. Green indicates yes and blue indicates No. Majority (63.46%) of the participants have opted yes and 36.54% have opted No.

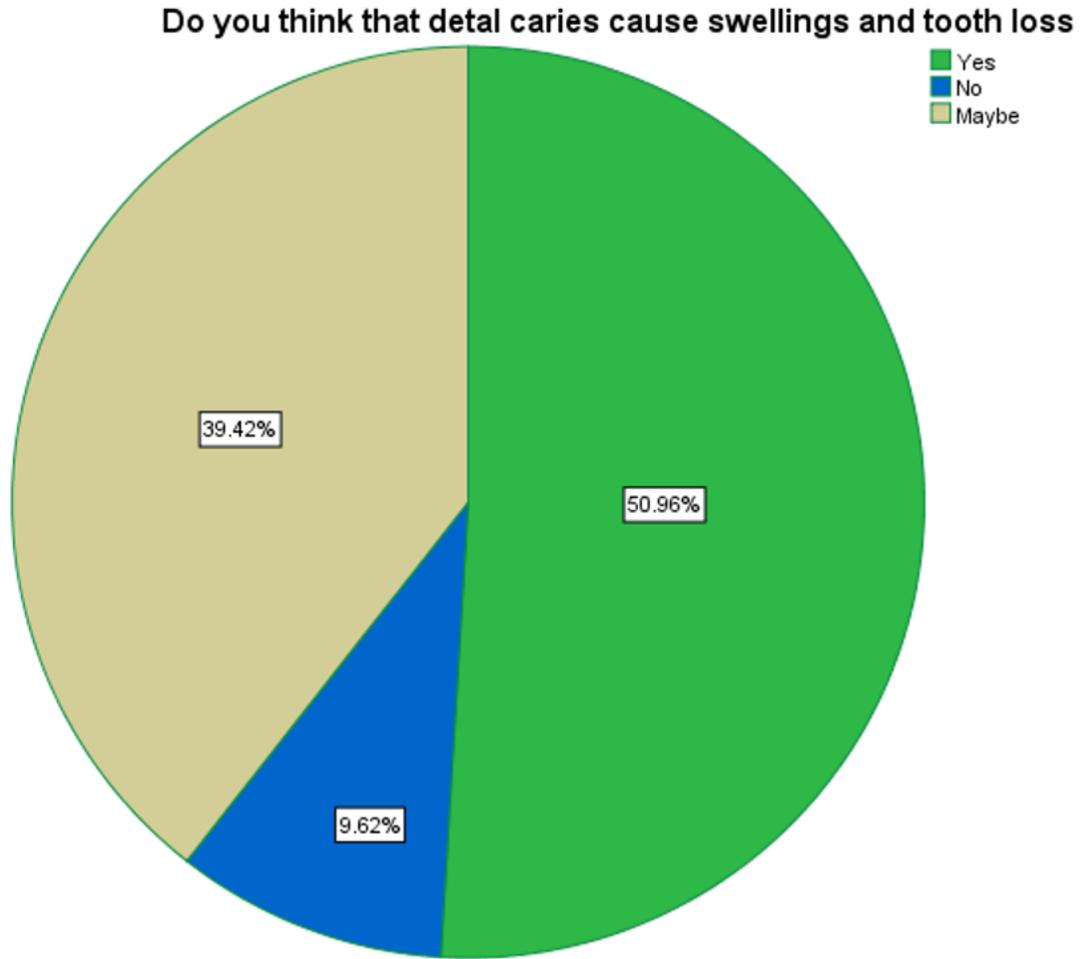


FIGURE 9: Shows the response of participants on consequences of dental caries. Green indicates yes , blue indicates no and beige indicates maybe. Majority, 50.96% of the participants were aware whereas 9.62% who have opted no and 39.42% who have opted maybe were unaware.

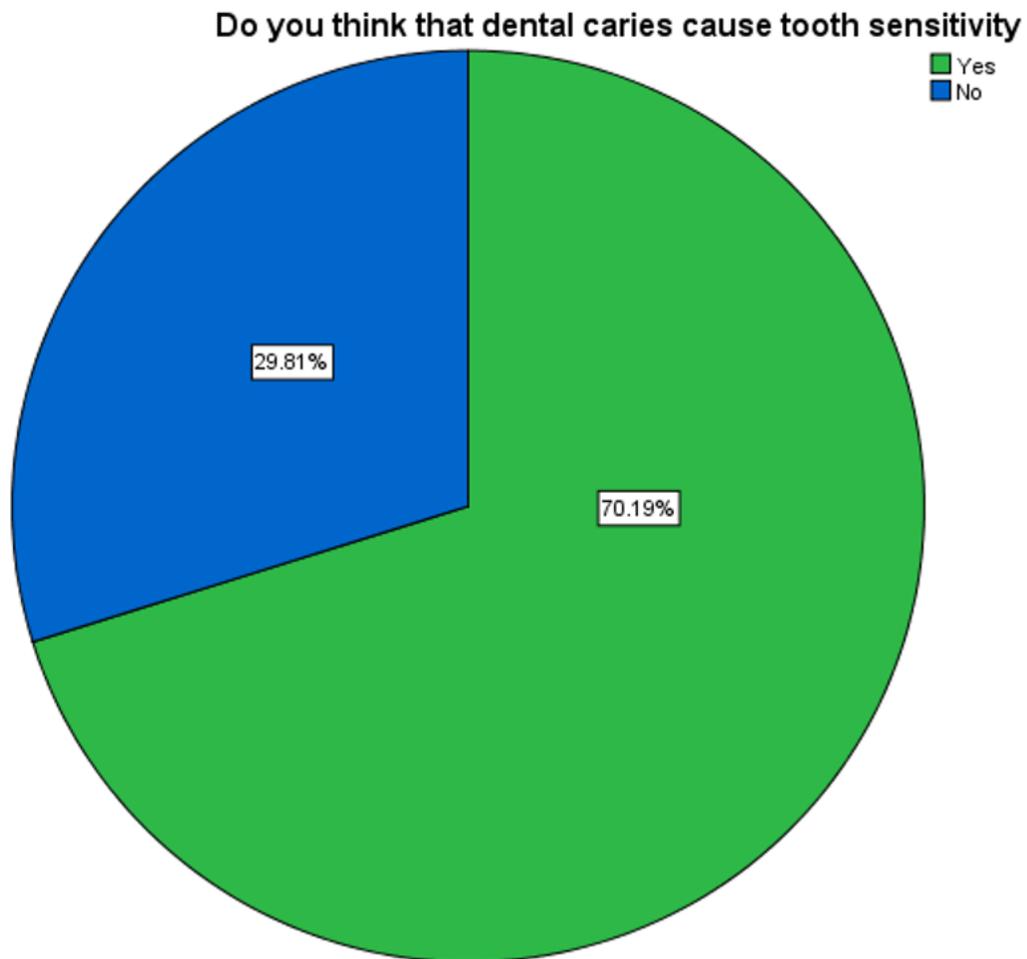


FIGURE 10: Shows the response of participants on dental caries causing tooth sensitivity. Green indicates yes and blue indicates no. Majority (71.15%) of the participants have opted yes and 28.85% have opted no.

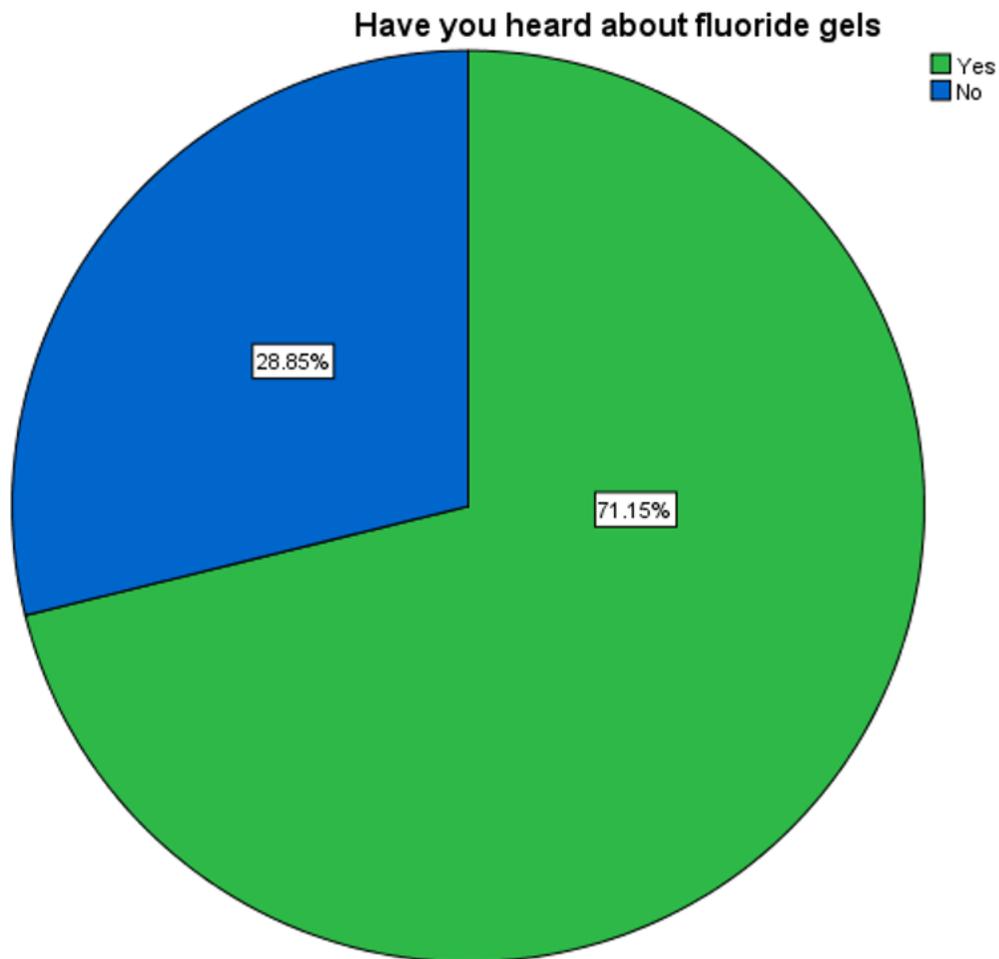


FIGURE 11: Shows the response of participants on awareness of fluoride gels. Green indicates yes and blue indicates no. Majority (83.65%) of the participants were aware of fluoride gels and only 16.35% were not aware.

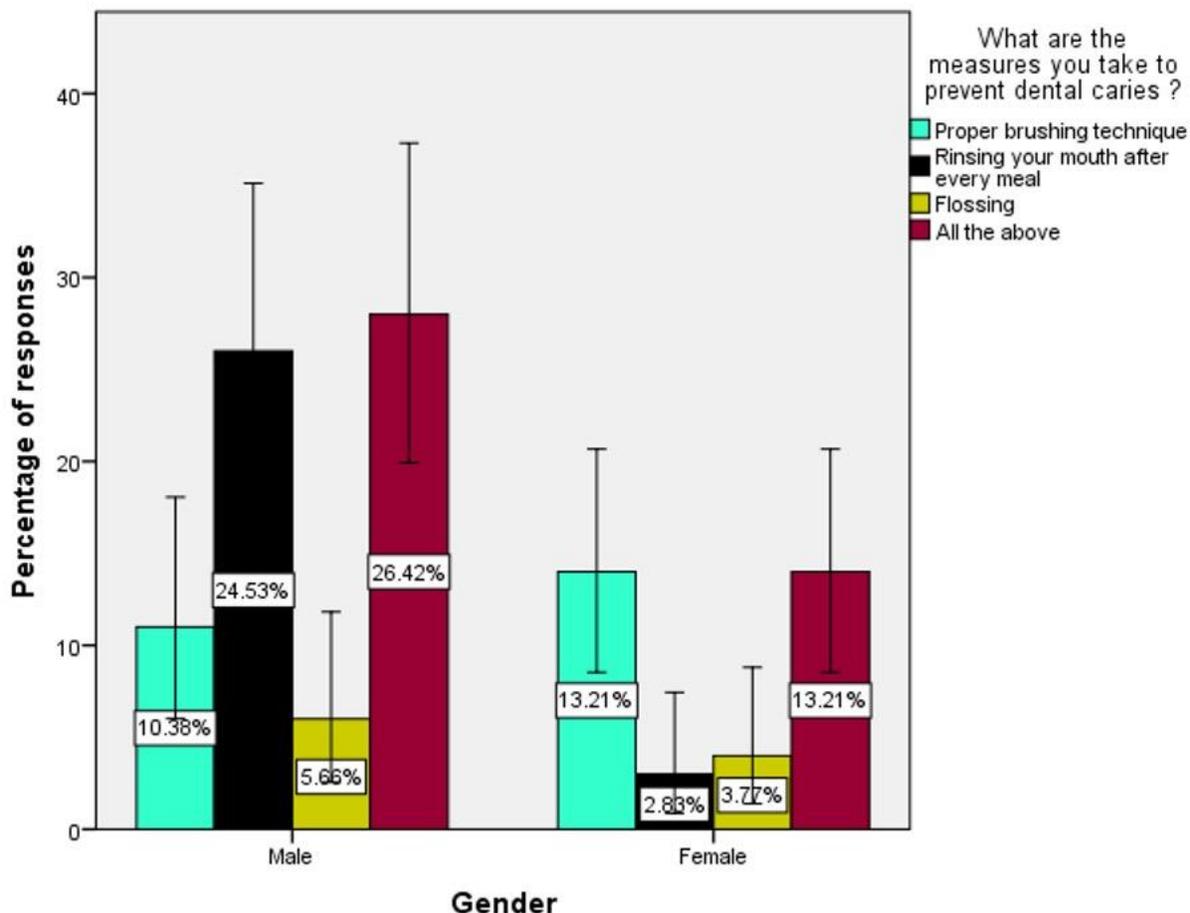


FIGURE 12: The bar graph represents the association between the gender and preventive measures for dental caries by the respondents. X axis represents gender and Y axis represents the percentage of responses for the preventive measures for dental caries. Fluorescent blue represents proper brushing technique, black represents rinsing of mouth after every meal, green represents flossing and magenta represents all the above. Both males and females have responded that all the measures are to be followed. Pearson chi square test shows p value is 0.003 ( $p < 0.05$ ) and thus it is statistically significant.

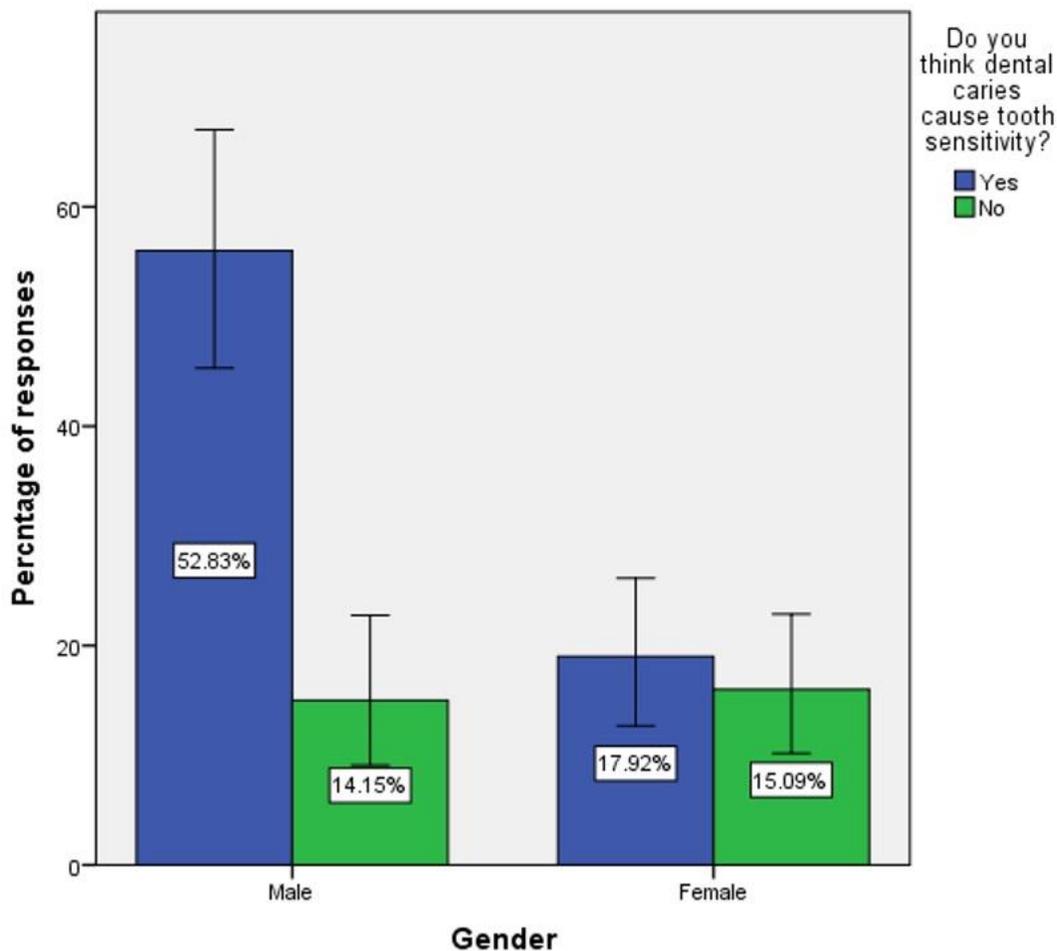


FIGURE 13: The bar graph represents the association between the gender and dental caries causing tooth sensitivity by the respondents. X axis represents gender and Y axis represents the percentage of responses for whether dental caries lead to tooth sensitivity. Green indicates yes and blue indicates no. Both males and females have said that dental caries cause tooth sensitivity. Pearson chi square test shows p value is 0.004 ( $p < 0.05$ ) and thus it is statistically significant.

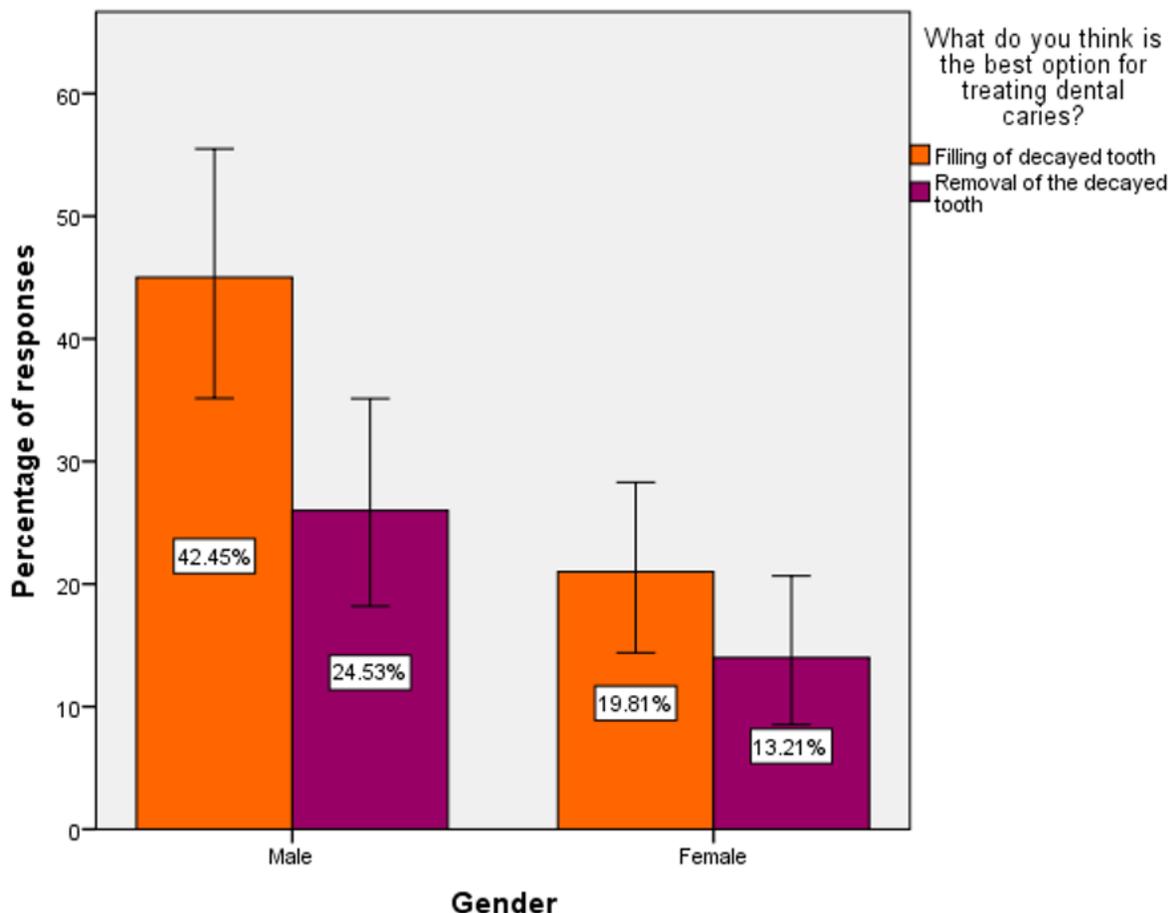


FIGURE 14: The bar graph represents the association between the gender and opinion on the best method to treat dental caries by the respondents. X axis represents gender and Y axis represents the percentage of responses for opinion on the best method to treat dental caries. Orange indicates filling of decayed teeth and purple indicates removal of decayed teeth. Restoration of the decayed teeth is opted by the majority of the population, both males and females. Pearson chi square test shows p value is 0.003 ( $p < 0.05$ ) and thus it is statistically significant.

**DISCUSSION -**

In our study, it is concluded that males were more aware of dental caries, its prevalence, causes, treatment, and management compared to females. Majority of the participants were aware of the importance of fluoride gels in prevention of caries. Regular checkup by an individual to maintain his/her oral hygiene is important. In our study it was recorded that nearly 50% of the population visited the dentist only during pain.

Dental caries is commonly seen among all, irrespective of age and it can be easily prevented by following few preventive measures and maintaining proper oral hygiene. One must get regular check ups with a dentist, over consumption of sweets and dietary sugars should be prevented, not only brushing twice a day but also proper brushing technique must be followed. The study shows that the majority of the study population are aware of the preventive measures, and management of dental caries(27).

Cavities, also known as tooth decay or caries, are caused by a variety of causes, including bacteria in the mouth, excessive snacking, consuming sugary beverages, and not brushing the teeth thoroughly. Nearly 31% of the population in the present study have said that caries occur due to overconsumption of sweets which is consistent with the previous article(28).

In most cases, dental caries do not cause any significant symptoms. Toothache or reaction to hot or cold foods and drinks may be present when symptoms are present. People may have dental caries symptoms all the time or only on occasion. Any of these dental caries symptoms can be serious at times. Older aged people mostly prefer extraction of tooth over treatment or filling of tooth. The present study has come up with a similar conclusion that the younger population prefer filling or treatment of decayed teeth while the older population prefer extraction of teeth which is consistent with the article(29,30).

Cavities need the care of a dentist. Several home remedies, on the other hand, may help to reinforce tooth enamel in the pre-cavity stage. This is known as remineralizing, and it avoids the formation of cavities. Brushing teeth twice a day with fluoride toothpaste has been known to remineralize tooth enamel and avoid cavities. Rinses of mouth after every meal and flossing prevents accumulation of food particles in the fissures and pits of the tooth. Usage of proper toothpastes also prevents the risk of dental caries. Fluoride gels and fluoridated water prevents the growth of caries causing bacteria in the mouth. 70% of the population are aware of fluoride gels which is inconsistent with the previous previous study(31),(32)

The survey was conducted only with a sample size of 104 people. This cannot be considered as the whole population representation and the result may change statistically. Perfect results can be obtained only with an even larger population. In future, this study should be done on a large scale population

with an innovative technique for better results. As dental caries are prevalent among all the age groups, the data obtained in the study must be again investigated in future.

#### **CONCLUSION -**

The present study thus concludes that the general population is aware about dental caries and its management. It is of utmost importance to educate the new generation to be able to understand the various aspects of dental caries and give them some knowledge on their management and treatment. Restriction of dietary fermentable carbohydrates, exposure to fluoride-containing products, and early caries diagnosis should be emphasised in order to prevent dental caries and/or reduce the need of invasive restorative treatment. The present study would also be advantageous for dieticians and other professionals working in dietary and health related professions to become familiar with dietary patterns and caries inducing factors in order to reduce the prevalence of the dental caries disease all over the world.

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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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#### **AUTHORS CONTRIBUTION -**

Bharath Kumar. N : Literature search, data collection, analysis, manuscript drafting.

Dr. Palati Sindhuja ,Dr. Suganya.P : Data verification, manuscript drafting.

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