

# **A SURVEY ON PREVALENCE OF DENTAL CARIES DUE TO INTAKE OF HARD AND SOFT CANDIES**

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**Type of study:** Original study

**Running title:** Assess the occurrence of dental caries due to the intake of hard and soft candies.

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## **ABSTRACT**

### **AIM**

The aim of this study is to assess whether chocolates i.e hard and soft candies consumption leads to increased risk of dental caries.

### **INTRODUCTION**

Hard and soft candies have high sugar content .Consumption of these chocolates has a high risk of dental caries due to the presence of bacteria . These bacterias use the sugar present in these chocolates as a medium of growth and releases acid during the breakdown of these sugars leading to dental caries.

### **MATERIALS AND METHOD**

A cross sectional study was done using the online platform ,a questionnaire was formed and circulated . In this questionnaire the subjects' addiction level on chocolates were assessed. About hundreds participants' responses were recorded who were below the age of 23.

### **RESULTS**

When the final results were analysed, we found that most of the participants were mildly addicted to chocolates, and due to this prevalence of dental carries also increased.

### **CONCLUSION**

So there is an association with the prevalence of dental caries and consumption of chocolates.

## **KEY WORDS**

Dental caries, sugar consumption, hard candies, soft candies, chocolates.

## **INTRODUCTION**

Dental caries also known as tooth decay leads to a lot of pain and sufferings and it's a chronic disease. It's one of the most prevalent ailments, even more than nutritional deficiency and cold. Caries are influenced by many factors including environmental, physical ,biological etc.(1) .Improper maintenance of oral health decreases the quality of your life (2).Even though there is a decrease in dental caries in recent years it remains a major public health problem in most counties.Untreated caries of the permanent teeth constitute about 36% of the population(3).

Children who are below the poverty line generally has a higher risk of caries and hence epidemiology of caries will always play a major role in the dental public health(4)(5) .It involves the chemical and physical composition of dental layers along with the behavioural factors such as maintaining their oral health and hygiene.(6) In developing countries the occurrence of dental caries is still high (7).The damage caused by caries leads to a decrease in the quality of life of the people who are affected.(8) It affects their economy when it wants to be fixed, Thereby qualifying it as an important public health problem.(9).Frequent sugar intake was found as a potential risk for the increase of dental caries(10)(11). Our team has extensive knowledge and research experience that has translate into high quality publications (11–18),(19),(20),(8),(21,22),(23),(24),(5,6,25–27)

Therefore the objective of this study is to determine the prevalence of dental caries due to the intake of hard and soft candies in younger individuals.

## **MATERIALS AND METHOD**

A cross sectional study was done using the online platform for collection data. An online questionnaire was prepared to assess the chocolate consumption level among the younger individuals. The study sample for this study is 100. The questionnaire contained a set of 12 question were 2 question were for the demographic details and the rest 10 question were used to find out the participants awareness and prevalence of dental caries due to consumption of chocolates. The questionnaire was circulated among 100 participants. The responses were recorded, and statistical analysis done using SPSS software version 24. Pearson chi square test was used to analyse the recorded data.

### **QUESTIONNAIRE**

1. Age

A: below 15

B: 15 to 18

C: 19 to 23

D: Above 23

2. Gender

A: Male

B: Female

3. I wouldn't be able to stop eating chocolates once I start

A: yes

B: no

4. Do you prefer hard candies over soft candies

A: yes

B: no

5. Are you aware that over consumption of chocolates causes dental caries

A: yes

B: no

6. Does eating chocolate calm you down

A: yes

B: no

7. Can you resist the temptation to eat chocolates

A:yes

B:no

8. I often have cravings for chocolates

A: yes

B:no

9. Have you ever tried to reduce the intake of chocolates

A:yes

B:no

10. Do you get irritated if someone advises you to stop eating chocolates

A:yes

B:no

11. Chocolates has more demerits than merits

A:yes

B:no

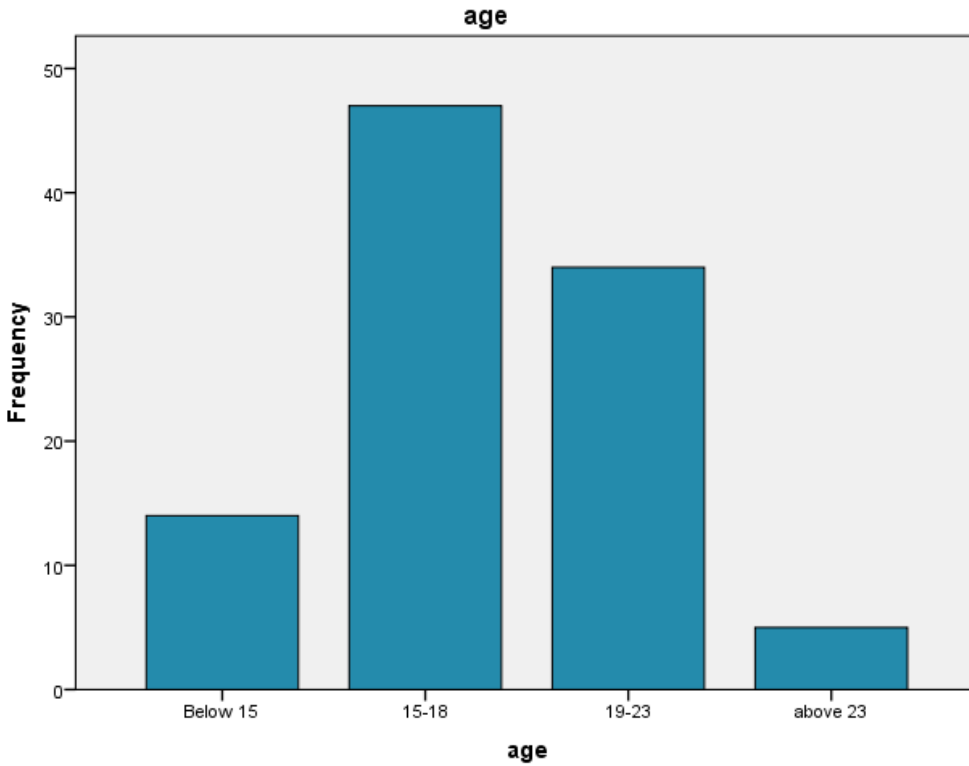
12. Does chocolates worsen dental caries

A:yes

B:no

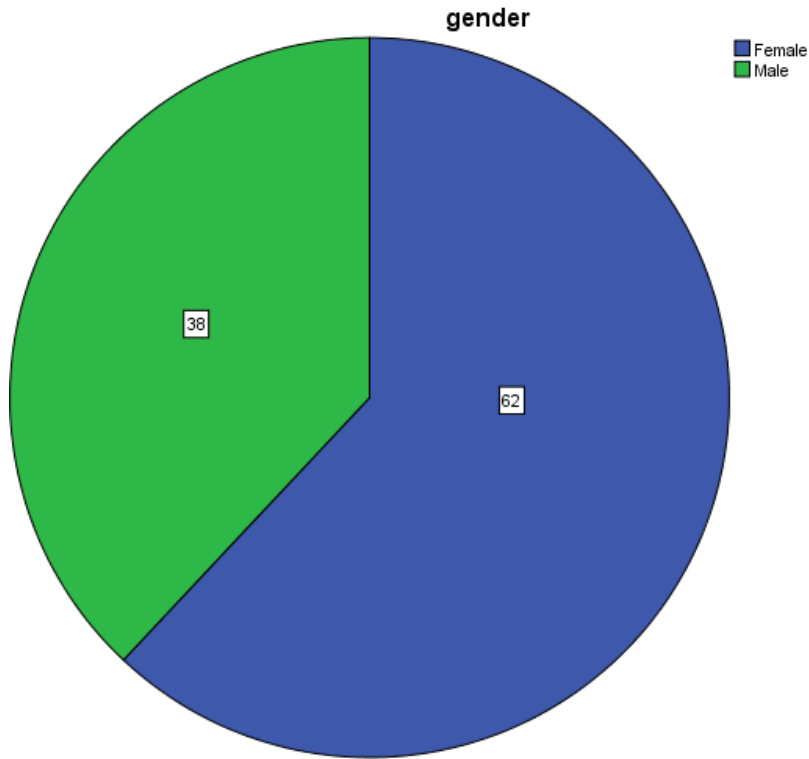
## **RESULTS**

Among the total survey conducted the majority of the group were between the age group 15 to 18 . Among the total participants 62% of them were females. About 53% of the population agreed that they wouldn't be able to stop eating chocolates once they start and for about 71% of the population eating chocolates calms them down. Most of the participants were aware that chocolates increase the risk of dental caries and about 71% of the population attempted to reduce the intake of chocolates.



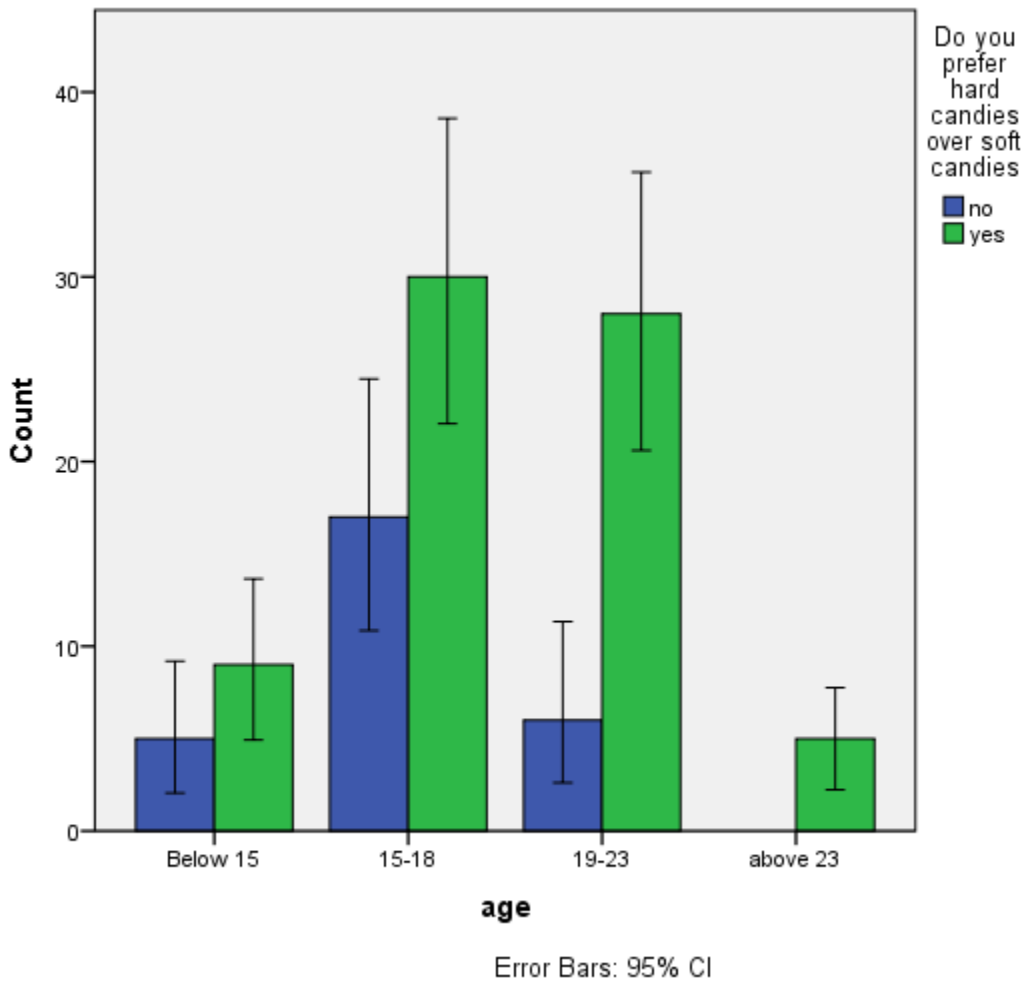
**Figure 1**

Figure 1 depicts the bar graph of participants and their age group. X axis first represents the age group below 15, second represents the age group between 15 and 19, third represents the age group between 18 and 24 and fourth represents the age 24 and above. Y axis represents the participants percentage. 14 participants belonged to group 1, 47 participants belonged to group 2, 34 participants belonged to group 3 and 5 participants belonged to group 4.



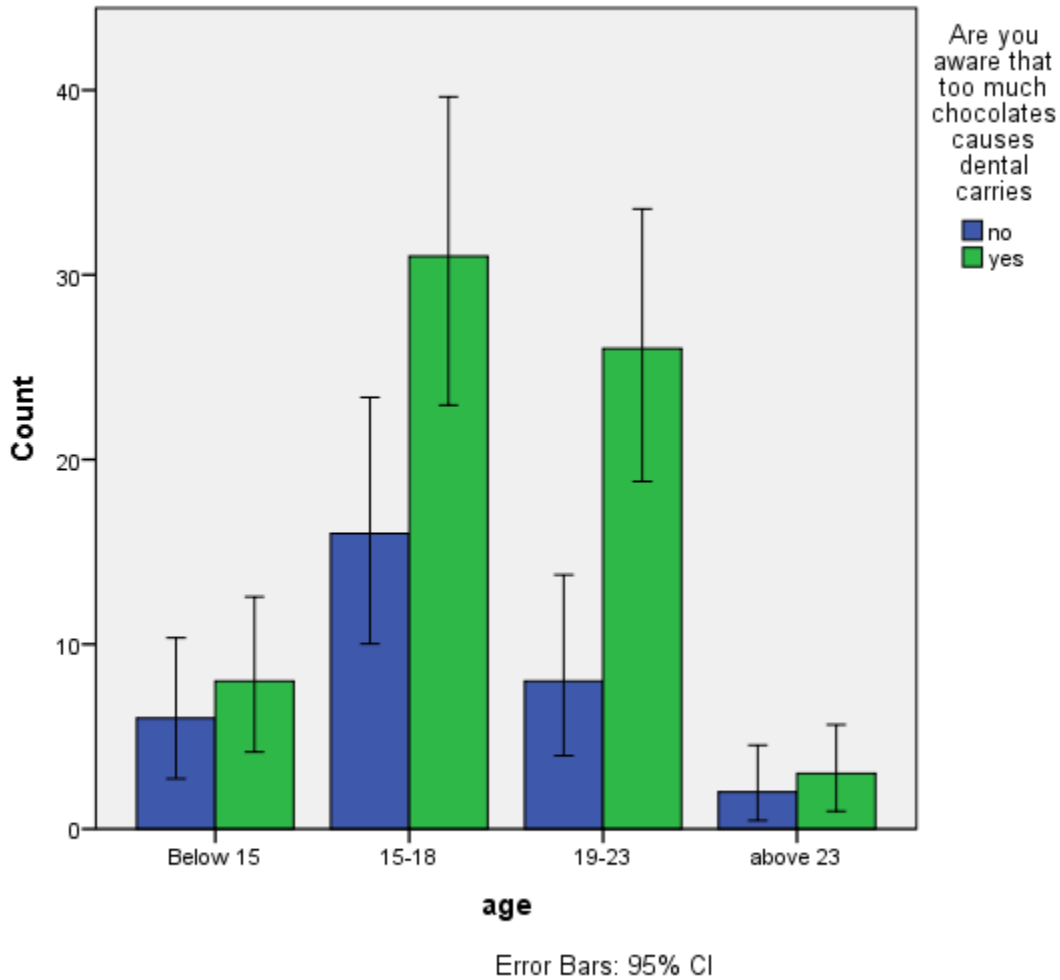
**Figure 2**

Figure 2 depicts the pie chart for gender distribution of the study participants. 1 represents females and 2 represents females. Among the total participants 62% of them were females and 38 were males.



**Figure 3**

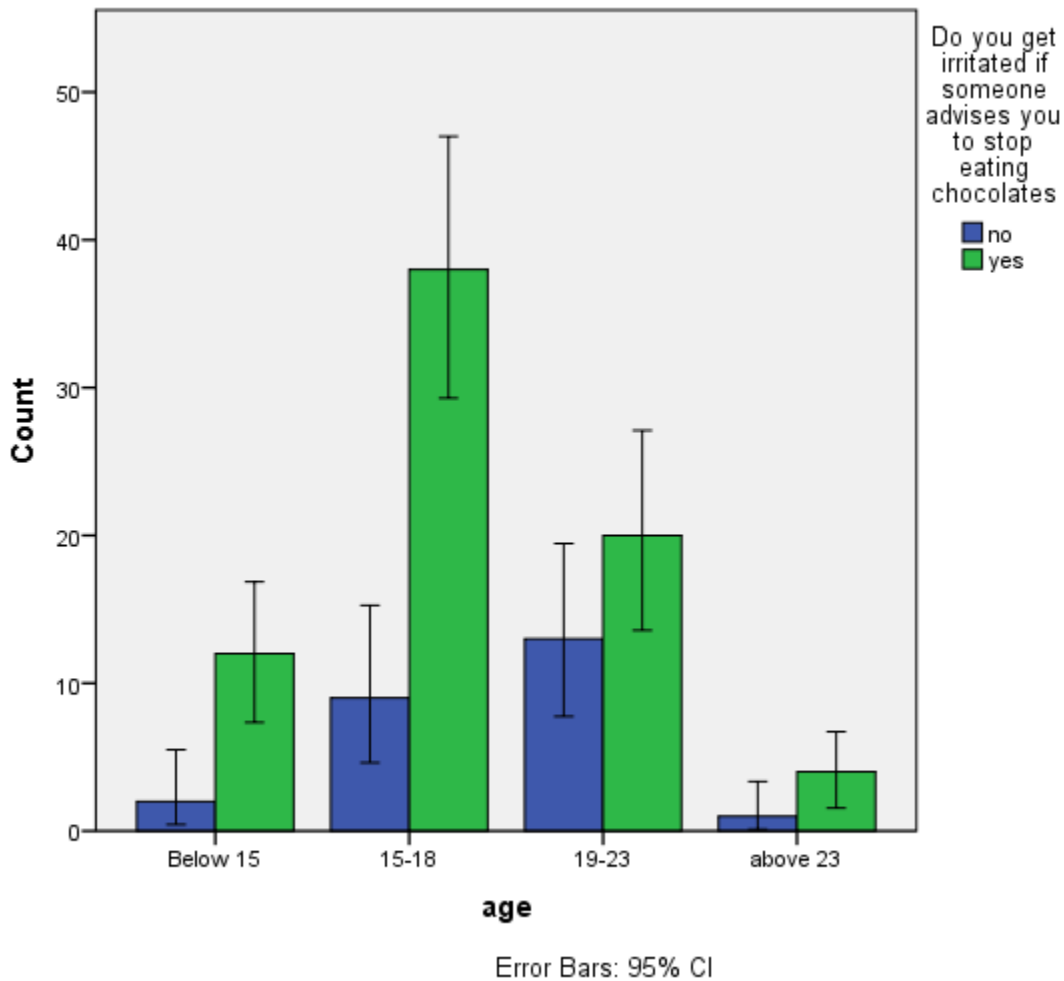
Figure 3 depicts the bar graph between age and their preference for hard and soft candies. X axis represents the age group and Y axis represents the participants response. The age groups are below 15, between 15 and 19, between 18 and 24 and 24 and above. In the above graph green represents the response “no” and blue represents the response “yes” . 5 participants from age group below 15 ,17 participants from age 15-23 , 6 participants from age group 19-23 preferred hard candies over soft candies.The obtained results had the p value of 0.146 from Pearson chi square test , hence the obtained value is statistically insignificant.



#### Figure 4

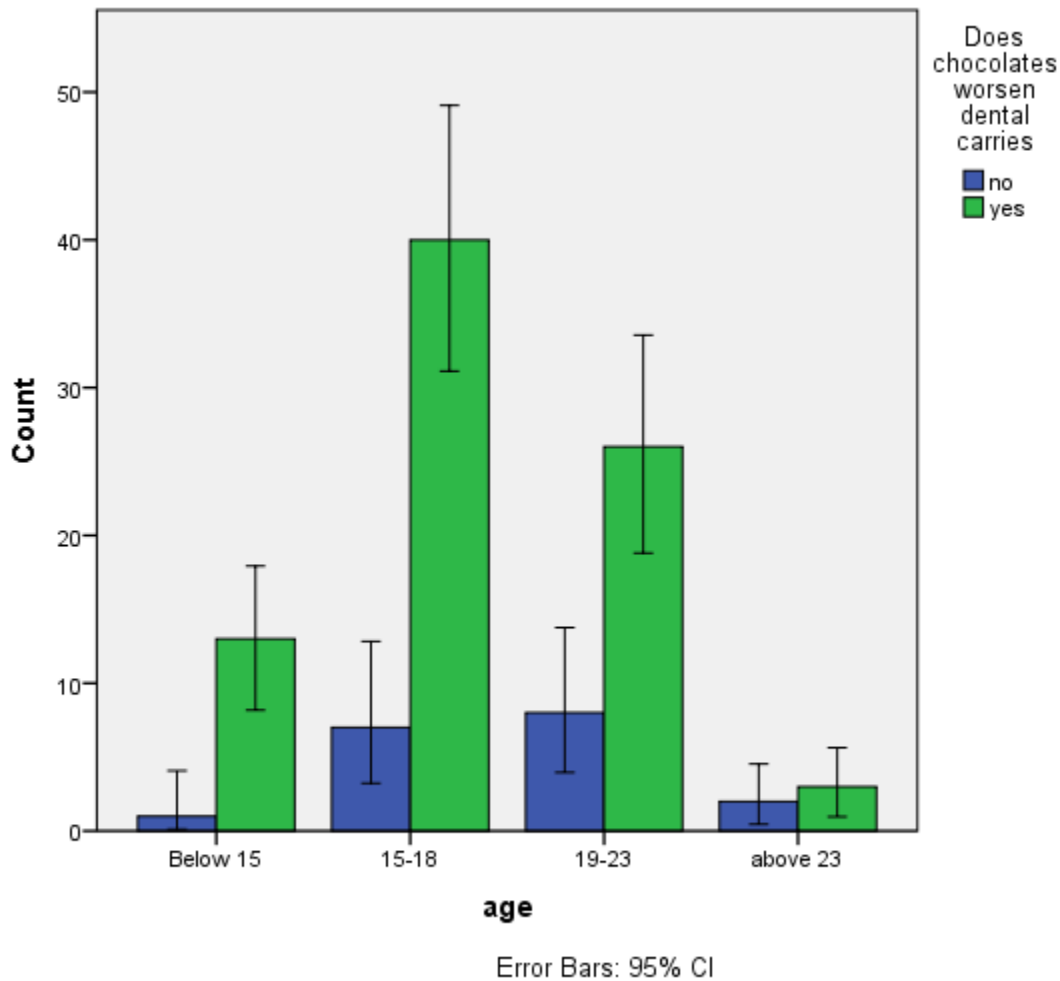
Figure 4 Depicts the association graph between age group and participants response. X axis represents the age group and Y axis represents the participants response. The age groups are below 15, between 15 and 19, between 18 and 24 and 24 and above. In the above graph green represents the response “no” and blue represents the response “yes” . 6 participants from age group below 15, 16 participants between the age group 15 and 19 , 8 participants from age group 19-23, 2 participants from age group below 23 were aware that too much chocolates causes dental caries. The obtained results had the p value of 0.145 from Pearson chi square test , hence the obtained value is statistically insignificant.





**Figure 5**

Figure 5: depicts the bar graph between age and their response for the question “Do you get irritated if someone advises you to stop eating chocolates?”. X axis represents the age group and Y axis represents the participants response. The age groups are below 15, between 15 and 19, between 18 and 24 and 24 and above. In the above graph green represents the response “no” and blue represents the response “yes” . The addiction level of chocolates between the age group 15 to 19 was so high that most of them got irritated when they were advised about the ill effects of chocolates and convinced them to quit eating chocolates..The obtained results had the p value of 0.233 from Pearson chi square test , hence the obtained value is statistically insignificant.



**Figure 6**

Figure 6 depicts the bar graph between age and their awareness on the effect of chocolates on dental caries . X axis represents the age group and Y axis represents the participants response. The age groups are below 15, between 15 and 19, between 18 and 24 and 24 and above. In the above graph green represents the response “no” and blue represents the response “yes” . 1 participant from age group below 15, 7 participants from age group 15-18, 8 participants from age group 19-23, 2 participants from age above 23 were aware that chocolate consumption worsened dental caries. The obtained results had the p value of 0.194 from Pearson chi square test , hence the obtained value is statistically insignificant.

## **DISCUSSION**

Dental caries among 6 to 12 year olds were positively associated with high patterns of sugar consumption and the most common source of sugar consumed were hard candies. The daily consumption of sugar was twice the recommended amount set by the WHO.(28).

A study was conducted to assess different chocolates and the fall in pH of the dental plaque, dark chocolate has the least effect and caramel chocolates had the most drop in pH. (29).In this study 72% preferred soft candies .Here most of the caramel chocolates come under the categories of chocolates. So most of the participants who preferred soft candies had a higher risk of developing dental caries as the fall of pH in soft chocolates is more.

Caries have a serious impact on individuals and the population. It causes discomfort, functional limitations and pain . It also has an economical impact . Oral disease is the fourth most expensive disease in the developing countries(30). In this study 32 participants were aware of chocolates' impact on dental caries .

The lack of dental health experts and insufficient health infrastructure affected dental services in schools. Hence many of the children do not attend proper dental checkups. These children go to a dentist due to symptomatic reasons and not for preventive precautions.(31) Sugars given in sticky forms such as chocolates are shown to increase the caries activity.(32).72% of the population preferred soft candies which is sticky and has more risk of formation of dental caries. Dental caries lead to more tooth loss than that of the periodontal treatments in adults were major extraction could have been avoided if treated earlier(33)

## **LIMITATIONS**

The study conducted is limited to a particular geographical area hence the arrived results cannot be generalised throughout the country.

## **FUTURE SCOPE**

This study aims to create awareness about the prevalence of dental caries due to consumption of hard and soft candies.

## **CONCLUSION**

The prevalence of dental caries due to intake of chocolates is clear from this survey report.

Chocolates increases the the risk of dental caries as it sticks to the teeth .Even though people were aware that chocolates aggravates dental carries they still couldn't reduce their intake of chocolates.The present study concluded that hard candies causes more damage that soft candies but we can't bluntly say that chocolates are responsible for dental caries, it's one of the factors that aggregates the situation. Improper brushing of teeth and poor maintenance of oral hygiene is also one of the major reasons for prevalence of dental caries.The increased risk of dental caries can be avoided by brushing twice a day , gargling your mouth after eating and visiting your

dentist every 6 months regularly. As this is a cross sectional study there are no follow ups ,hence there are high chances of errors so future analytical study is required.

### **AUTHOR CONTRIBUTION**

Indugayathrie VT : Literature search, data collection, manuscript writing

Mrs.S.Sangeetha: Study design, data verification, manuscript drafting.

### **ACKNOWLEDGEMENT**

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### **CONFLICT OF INTEREST**

There is no conflict of interest.

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