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CHOCOLATE CONSUMPTION HABITS AMONG SCHOOL STUDENTS

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ABSTRACT:

Chocolate is a unique flavoured food used in our society, it is also known as 'food of Gods'. It is prepared from the seeds of a plant Theobroma cacao. The most important ingredient of chocolate is cocoa, a Central Nervous System (CNS) stimulant. Cocoa also has a potency to make its user addicted to it. Chocolate is also aphrodisiac in nature.Theobroma Cacao is a native of the Amazon basin and other tropical areas of South and Central America. Chocolate tends to be associated with happiness or improved moodchanges.Although chocolate has been found to improve mood,it has been noted that it may also lead to negative feelings such as guilt.Science it is often perceived as an unhealthy treat due to its sugar and fat content.The Aim of the present study was to survey and analyse about the chocolate consumption habits among school students.The Cross sectional study was done on school students.This is an online based survey study and taken in English medium language.The sampling method used was simple random sampling method.13 Questionnaires were prepared and was administered

through Google forms.The statistics used to analyse the results was descriptive statistics and chi square test using spsssoftware.The data was collected and statistically analysed.In a survey conducted among 100 school students,66% of the respondents belong to age group 13-18 years,32% of the respondents belong to age group 9-12 years and 2% belong to age group 4-8 years.52% of the respondents answered that they consume chocolates,23% said that they don't consume chocolates and 26% consumed chocolates only sometimes.56% of the participants answered that they consume chocolates Every other day,24% answered Every week and 20% responded Every Day.From the survey we can conclude that, there is a high rate of chocolate consumption habits among the school students and hence there is an increased incidence of cavities.Awareness must be created among school students about the right way of consuming chocolates.

INTRODUCTION

Chocolate is a unique flavoured food used in our society, it is also known as 'food of Gods'. It is prepared from the seeds of a plant Theobromacacao.The most important ingredient of chocolate is cocoa, a Central Nervous System (CNS) stimulant. Caffeine also has a potency to make its user addicted to it. Chocolate is also aphrodisiac in nature (1).Theobroma Cacao is a native of the Amazon basin and other tropical areas of South and Central America. These plants grow best under canopy of tropical rainforests.Sometimes, they need to be shaded from direct sun and wind, to flourish, especially in the stage of early growth.Cocoa trees begin to bear fruit when they are three to four years old (2).Chocolate consumption may be influenced by different aspects including its perceived health benefits, holiday season, consumer gender and background, among others.Cocoa-related products like chocolate have taken an important place in our food habits and culture.The major side effects of chocolate consumption is dental caries which is the most prevalent disease among the children in the global scenario.Oral health is an integral part of general health (3).

Chocolate tends to be associated with happiness or improved mood changes, which may be a reason why consumers eat it. The cocoa includes tryptophan, an essential amino acid that is a precursor to serotonin, which is a neurotransmitter involved in regulating the moods. Although chocolate has been found to boost mood, it has been noted that it may also lead to negative feelings such as guilt, also including boredom, depression and tiredness have been linked to food cravings (4).

Cocoa is rich in many healthy elements, the majority of the fiber in cocoa is insoluble. Cocoa seeds contain the minerals magnesium, copper, potassium and calcium, also cocoa is rich in flavonoids such as catechin, epicatechin, and procyanidins which have high antioxidant properties (5). The literature indicates that dark chocolate, milk chocolate and white chocolate should contain at least 18 % cocoa butter, 14 % nonfat cocoa solids and 35 % total cocoa solids; 2.5 % nonfat cocoa solids and 25 % total cocoa solids; and 20 % cocoa butter and 14 % milk solids, respectively. In filled chocolate, the shell should be at least 25 % of the total product weight and praline should contain at least 25 % chocolate produced from a mixture of dark,milk, extra milk and white chocolate. Chocolate should be bright and smooth in appearance and mahogany in color, have a rich flavor, make a cracking sound when broken and not crumble (6).The flavanols present in the cocoa reduce oxidative stress,

improve endothelial function and increase insulin resistance.The polyphenols in chocolate protect cell membranes against free radicals, increases HDL-cholesterol levels and prevent plaque formation in artery walls (7). Milk chocolate and, especially, white chocolate are higher in fat, calories, and added sugars in comparison to dark chocolate, thus may reduce healthful effects like fat depositions in the body. A prospective cohort study found a dose-dependent relationship between chocolate-candy consumption and weight gain in women with each additional 1 oz serving per month associated with an average weight gain of 0.92 kg in the three-year study period (8).

Importance of this research is that the consumption of chocolate has both favorable and unfavorable effects on health, the significance of this study is the determination of the factors that affect the chocolate consumption of female and male prospective teachers. Chocolate is beneficial to health due to both the antioxidants and polyphenols in its composition and its stress relieving properties. However, it could also have negative health effects as excessive consumption of chocolate could lead to obesity due to its fat content. Previously our department has published extensive research on various aspects of prosthetic dentistry (9–19), this vast research experience has inspired us to research about the chocolate consumption habits among school students. The Aim of the present study was to survey and analyse about the chocolate consumption habits among school students.

MATERIALS AND METHODS

The Cross sectional study was done on school students.Awell structured Questionnaire on basis of personal information, Education level, frequency and consumption habits of chocolates and it's related coco products were taken into consideration.Both Male and female subjects of age group 4-18 years were selected.This is an online based survey study and taken in English medium language.The sampling method used was simple random sampling method.13 Questionnaires were prepared and was administered through Google forms.The result output variables were collected and was represented in pie charts.The statistics used to analyse the results was descriptive statistics and chi square test using spsssoftware.The advantages are it is economic, easy to create and can have a wide reach. The disadvantages are that it has survey fatigue and response bias.The purpose of the study and the questionnaire was explained before these questions are given to students.The questionnaire required approximately ten minutes to complete.

RESULTS AND DISCUSSION

The data was collected and statistically analysed.On Analysis we can find that there is a high rate of chocolate consumption habits among the school students and hence there is an increased incidence of cavities.

In a survey conducted among 100 school students,66% of the respondents belong to age group 13-18 years,32% of the respondents belong to age group 9-12 years and 2% belong to age group 4-8 years (Figure 1).In our study,74% of the participants were Male and 26% were Female (Figure 2).32% of the participants body type were Slender/Slim,49% were Athletic and 19% were overweight (Figure 3).52% of the respondents answered that they consume chocolates,23% said that they don't consume chocolates and 26% consumed

chocolates only sometimes (Figure 4).56% of the participants answered that they consume chocolates Every other day,24% answered Every week and 20% responded Every Day (Figure 5).49% of the participants responded their preference as Dark chocolate,30% responded White chocolate and 21% responded Regular light Brown chocolate (Figure 6).37% of participants said the reason for their chocolate consumption is to ease stress,33% answered to feel in love and 30% answered to be contended (Figure 7).63% of the participants answered that they are aware of effects of chocolates on emotions and 37% were not aware of the chocolate's effects on emotions (Figure 8).51% answered that they were aware of the bad effects caused by chocolate consumption and 49% answered No for their awareness of ill effects caused by chocolate consumption (Figure 9).49% answered Yes and 51% answered No for their awareness about the chemical composition of chocolates (Figure 10).57% responded that they feel relieved of stress after eating chocolate and 43% responded that they don't feel relieved of stress after consumption of chocolates (Figure 11).36% answered Yes,32% answered No and 32% answered sometimes for the question on soothness of participants mood after consuming chocolate (Figure 12).51% of the participants agreed on the studies that "Eating chocolate can also give rise to a feeling of anxiety" and 49% of the respondents disagreed on the studies that "Eating chocolate can also give rise to a feeling of anxiety" (Figure 13).

From the current study on chocolate consumption,We found that the younger students, 4-8 and 9-12 years age group,tend to consume more chocolates.A similar study carried out among the primary school children in the age group of 3–12 years in Kerala showed that the consumption of chocolates for all age groups combined to be 68.5%, which was a little high than our study (20). A Generalised report was drawn from the responses received from the students that most of them like to have chocolates, know the effects of taking excess chocolates and its chemical chemical composition too.These reports are similar to the studies done by Gibble,2011;Martin,Goya & Ramos,2013;on chocolate consumption in prospective teachers where the respondents agreed with chocolate consumption and its effects (21).Similar results were obtained in an original study with an overall consumption rate of chocolates (46.75%) and among girls it was 45.26% (22). Few aspects should be taken into consideration to get better insights into chocolate consumption as the habit would differ based on gender, age of the student and the general economic conditions will have an impact on the amount of chocolate consumption per day. We can also observe significant differences in chocolate consumption among male and female groups. Dark chocolate consumption was greater among Male.Milk chocolate is known to be considerably sweeter and less bitter than dark chocolate (23).

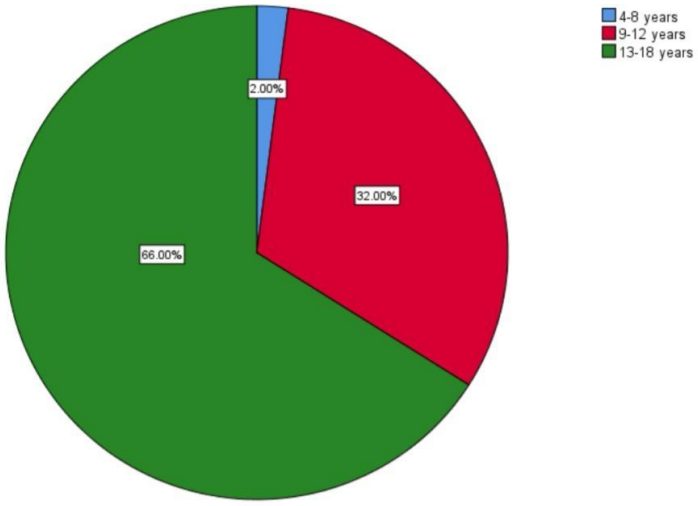

Figure 1:Pie chart showing the percentage distribution of responses about the age of the participants.32% of participants were in the age group 9-12 years (Red),68% were in the age group 13-18 years (Green) and 2% were in the age group 13-18 years (Blue).Majority of the participants were in age between 13 and 18 years (68%).

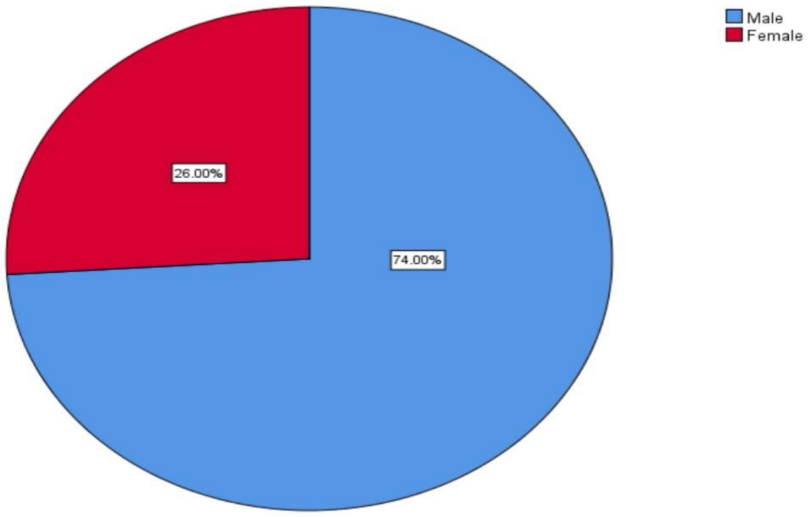

Figure 2:Pie chart showing the percentage distribution of responses about the Gender of the population.74% of participants were Male (Blue) and 26% were Female (Red).Majority of participants were Male (74%)

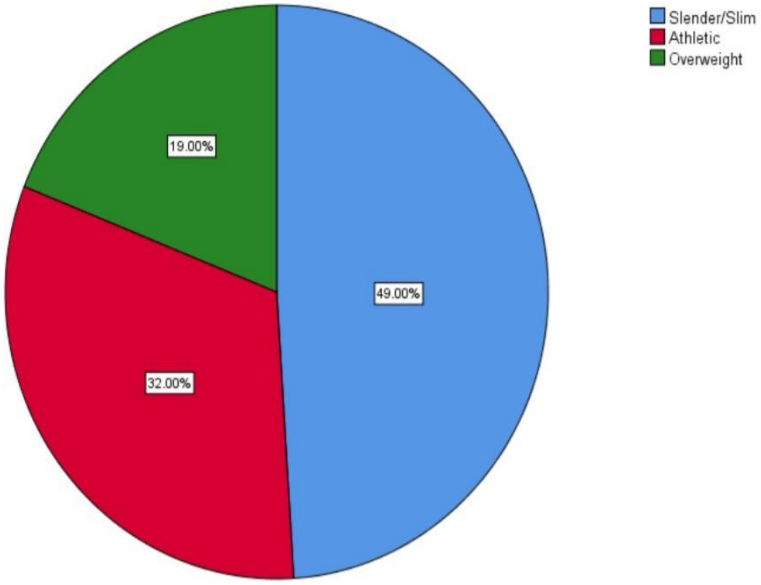

Figure 3:Pie chart showing the percentage distribution of responses about the body type of the participants.49% of participants were slender/slim (Blue),32% were athletic (Red) and 19% were overweight (Green).Majority of participants were slender/slim (49%).

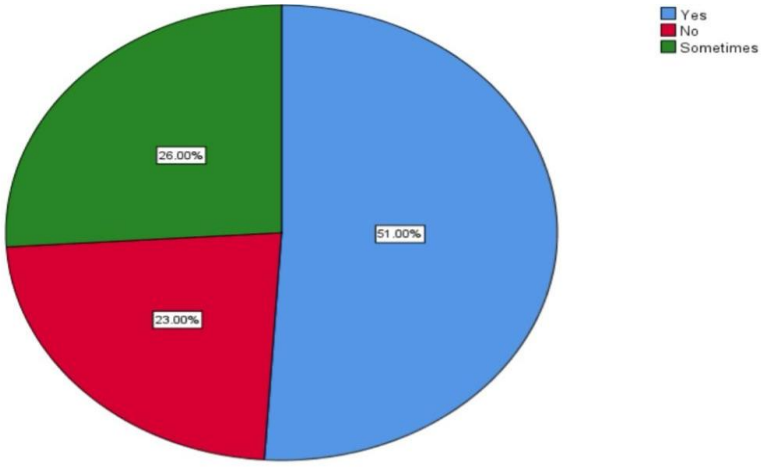

Figure 4:Pie chart showing the percentage distribution of responses about the consumption of chocolates by the participants.51% of the participants responded Yes (Blue),26% responded Sometimes (Green) and 23% responded No (Red).Majority of participants responded Yes (51%).

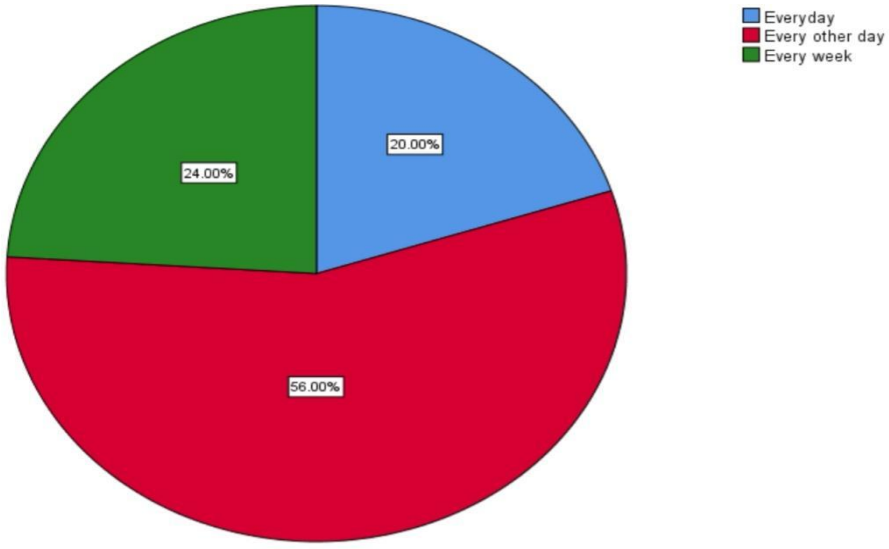

Figure 5:Piechart showing the percentage distribution of responses about the frequency of consumption of chocolate.56% of participants responded every other day (Red),24% responded every week (Green) and 20% responded everyday (Blue).Majority of participants responded every other day (Red).

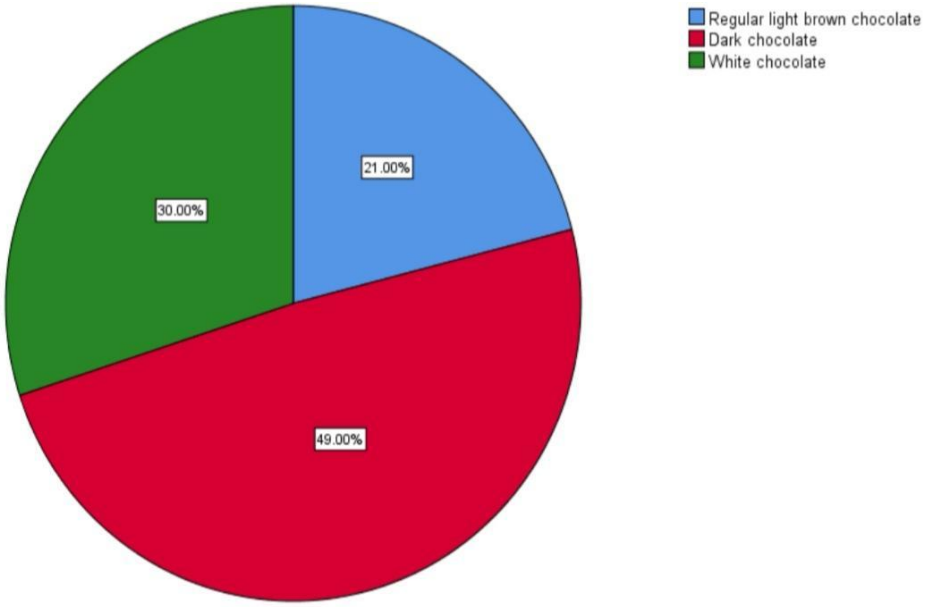

Figure 6:Piechart showing the percentage distribution of responses about the preference of type of chocolate.49% of participants responded dark chocolate (Red),30% responded white chocolate (Green) and 21% responded regular light brown chocolate (Blue).Majority of participants responded Dark chocolate (49%).

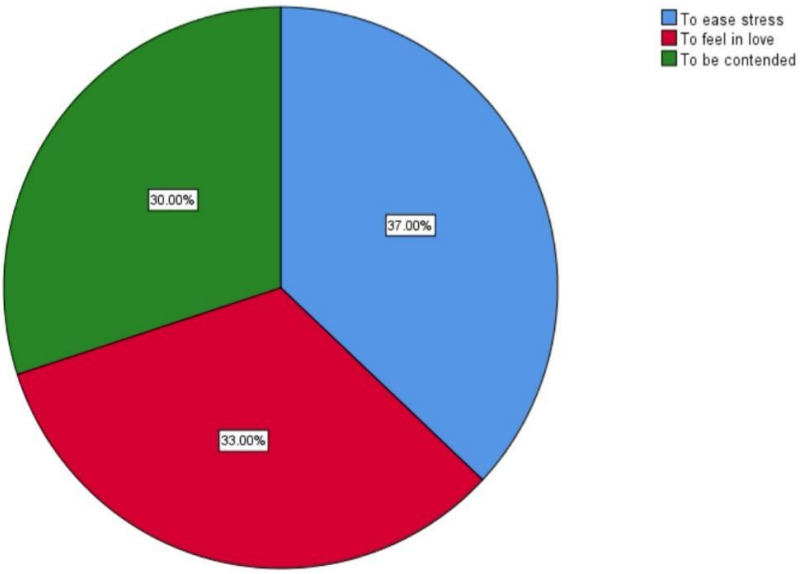

Figure 7:Pie chart showing the percentage distribution of responses about the reason for consumption of chocolates.37% of participants responded to ease stress (Blue),33% responded to feel in love (Red) and 30% responded to be contended (Green).Majority of participants responded to ease stress (37%).

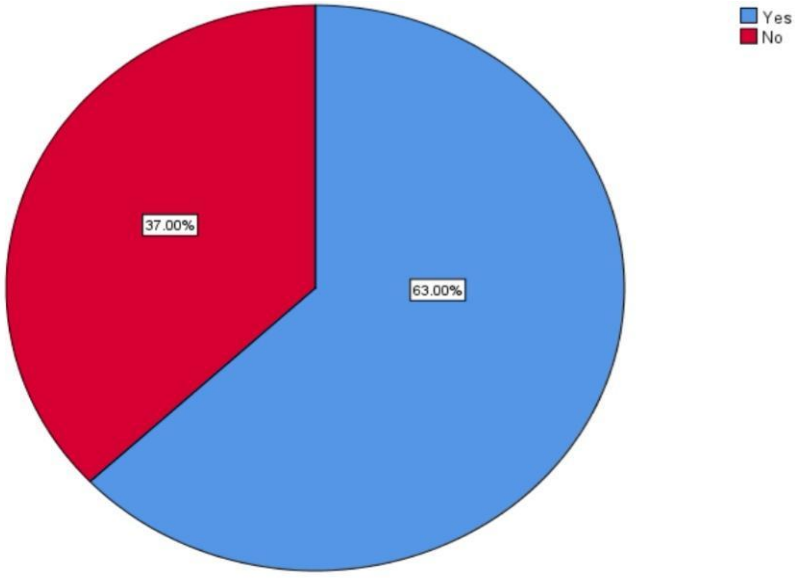

Figure 8:Pie chart showing the percentage distribution of responses about the psychological effects of chocolate consumption.63% of participants responded Yes (Blue) and 37% responded No (Red).Majority of participants responded Yes (63%).

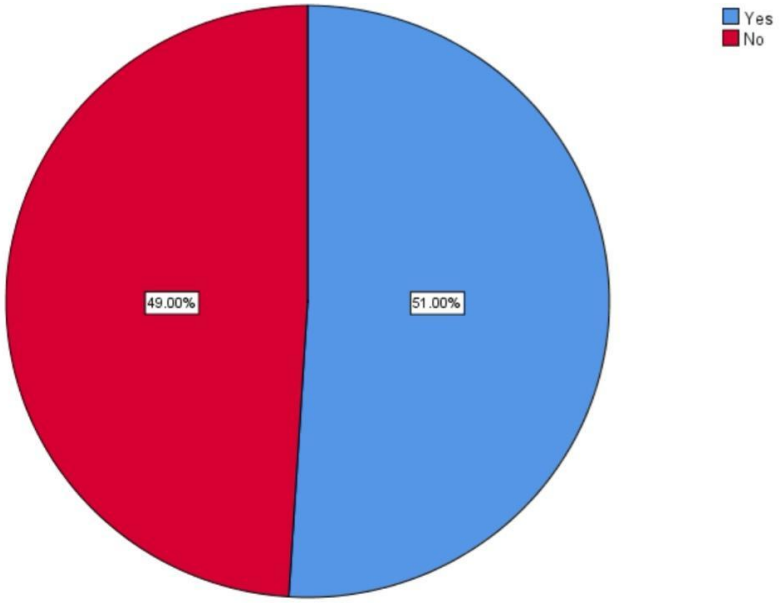

Figure 9:Pie chart showing the percentage distribution of responses about the awareness on bad effects caused by chocolate consumption.51% responded Yes (Blue) and 49% responded No (Red).Majority of participants responded Yes (51%).

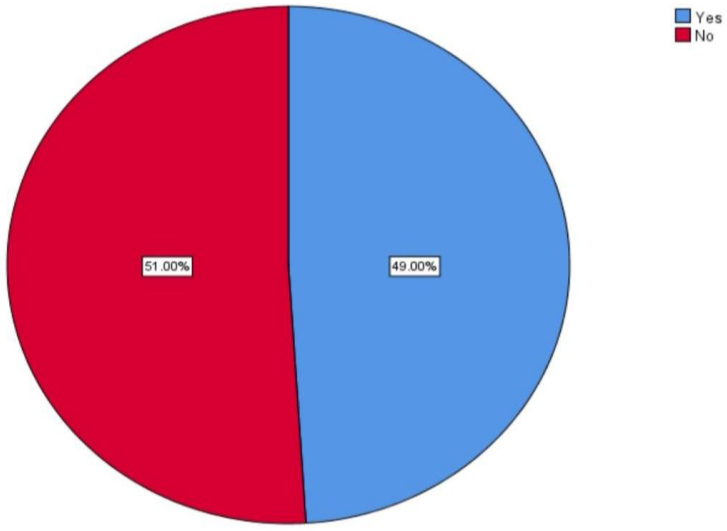

Figure 10:Pie chart showing the percentage distribution of responses about the awareness on chemical composition of chocolates.49% of participants responded Yes (Blue) and 51% responded No (Red).Majority of participants responded No (51%).

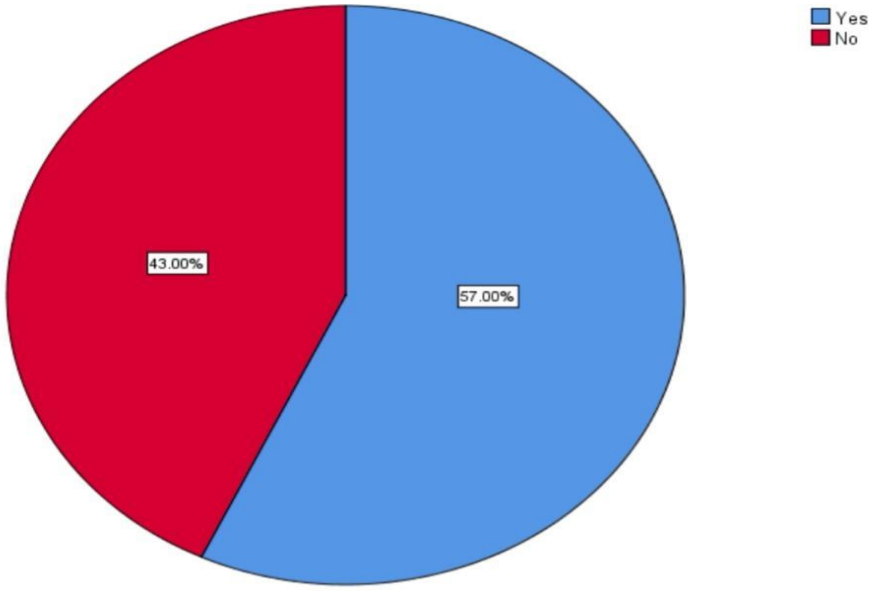

Figure 11:Pie chart showing the percentage distribution of responses about the relief of stress by chocolate consumption.57% of participants responded Yes (Blue) and 43% responded No (Red).Majority of participants responded Yes (57%).

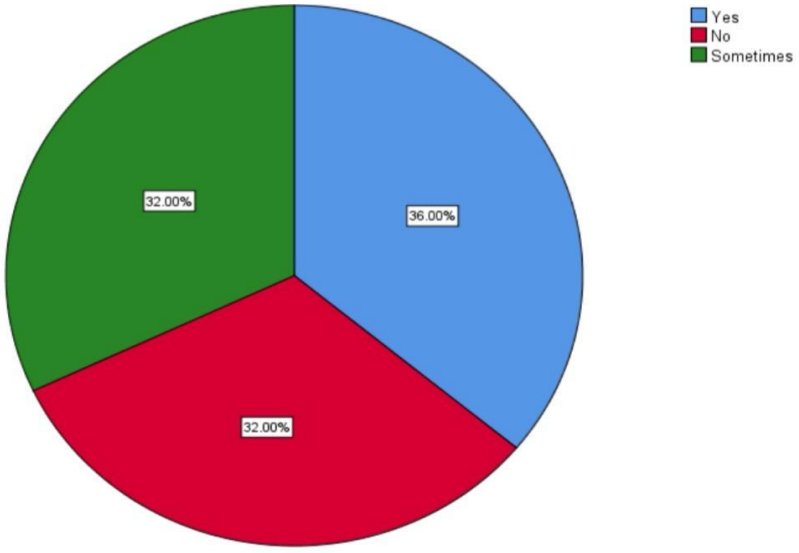

Figure 12:Pie chart showing the percentage distribution of responses about the soothness of mood after chocolate consumption.36% of participants responded Yes (Blue),32% responded No (Red) and 32% responded sometimes (Green).Majority of participants responded Yes (36%).

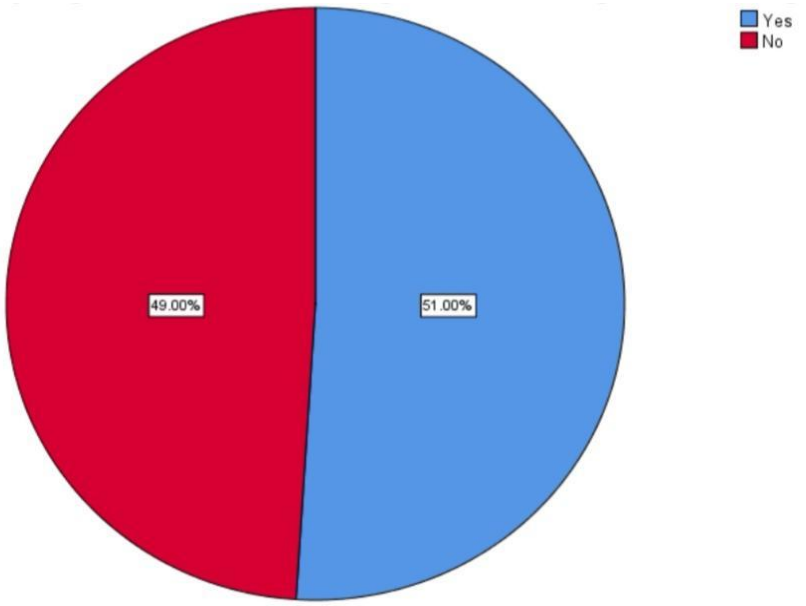

Figure 13: Pie chart showing the percentage distribution of responses about the agreement on studies that says "Eating chocolate can also give rise to a feeling of anxiety".51% of participants responded Yes (Blue) and 49% responded No (Red).Majority of participants responded Yes (51%).

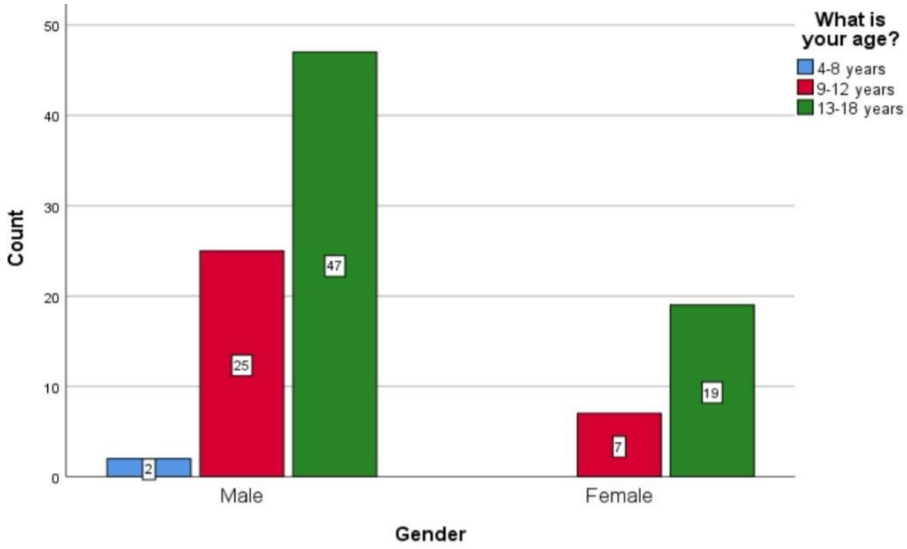

Figure 14: Bar chart depicts the association between gender with the age group of participants.X-axis represents the student's gender and Y-axis represents the number of responses (Age group).Blue colour denotes 4-8 years age group,Redcolour denotes 9-12 years age group and green colour denotes 13-18 years age group.Pearson's Chi square value=1.252,p value=0.648 ($p>0.05$) hence statistically not significant.Although it is statistically not significant it is implied that Majority of males 74% (47) were in the 13-18 years age group.

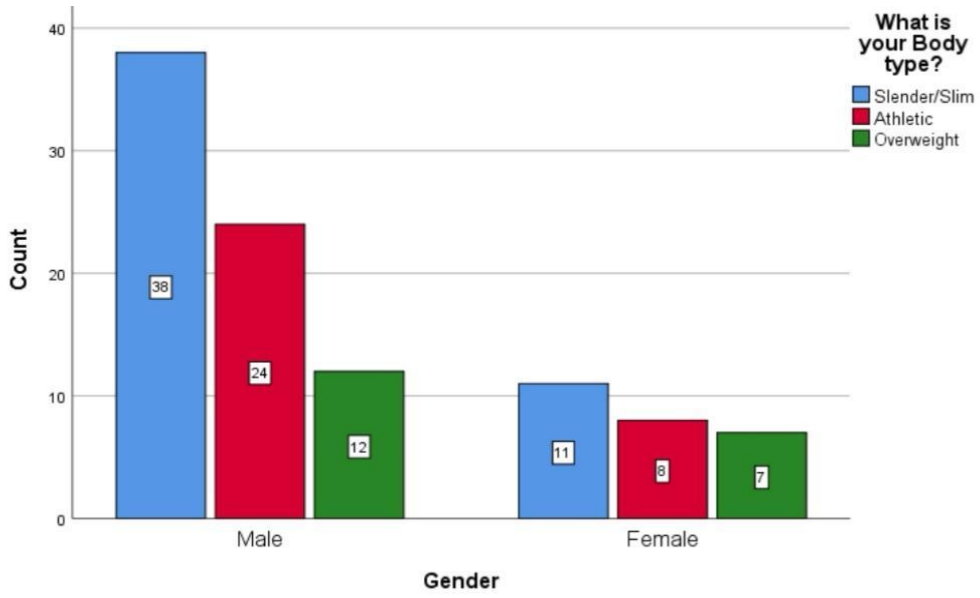

Figure 15: Bar chart depicts the association between gender with the body type of students.X-axis represents the student's gender and Y-axis represents the number of responses (body type of students).Blue colour denotes slender/slim,Redcolour denotes athletic and green colour denotes overweight.Pearson's Chi square value=1.499,p value=0.548 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of Males 74% (38) have a slender/slim body typ

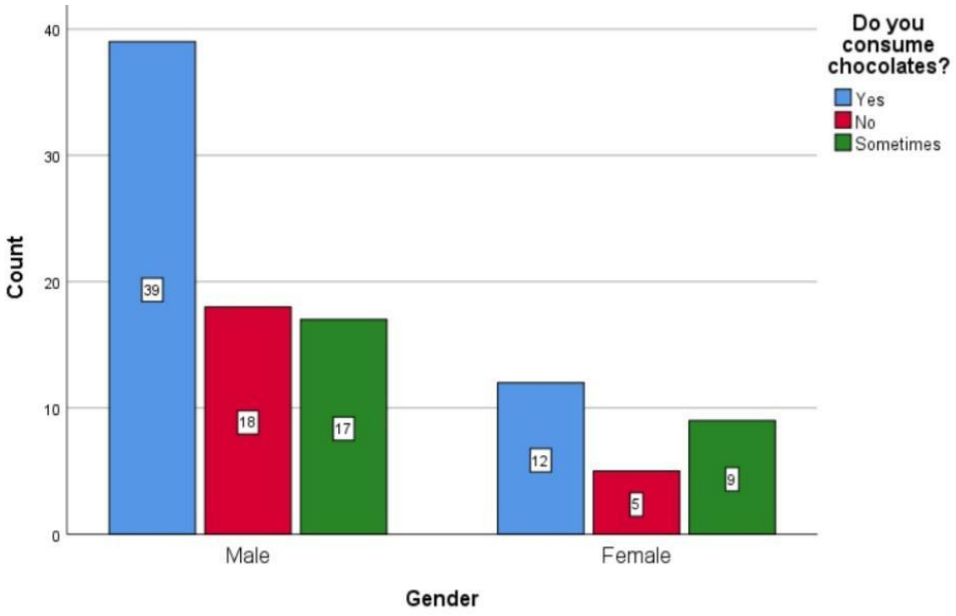

Figure 16:Bar chart depicts the association between gender with the habit of consumption of chocolates.X-axis represents the student's gender and Y-axis represents the number of responses (habit of chocolate consumption).Blue colour denotes yes,Redcolour denotes no and green colour denotes sometimes.Pearson's Chi square value=1.382,p value=0.548 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of males 74% (39) consumes chocolates everyday.

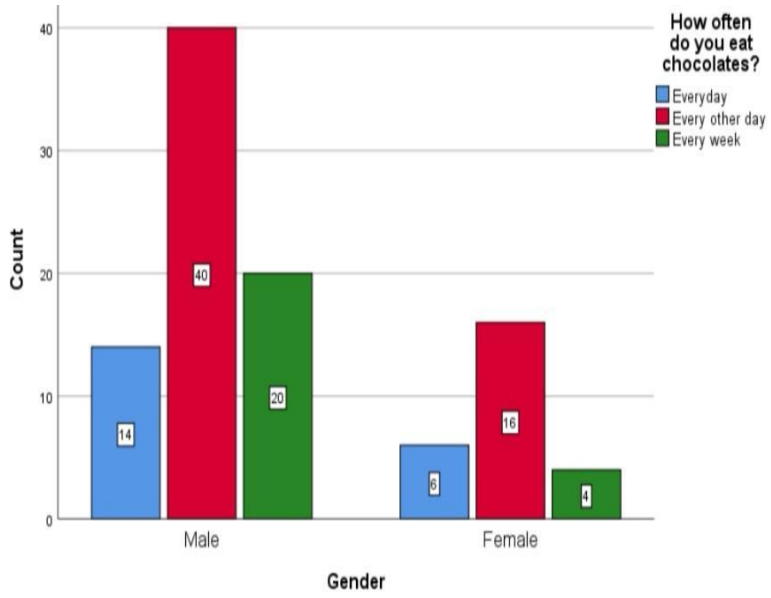

Figure 17: Bar chart represents the association between gender with the frequency of consumption of chocolates.X-axis represents the student's gender and Y-axis represents the number of responses (frequency of consumption of chocolates).Blue colour denotes everyday,Redcolour denotes every other day and green colour denotes every week.Pearson Chi square value=1.445,p value=0.638 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of males 74% (40) consumes chocolate every other day.

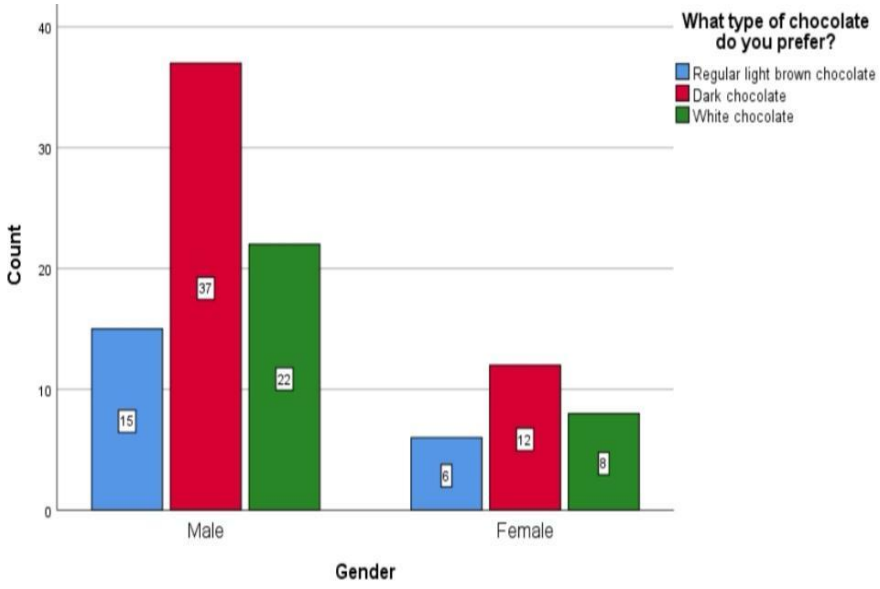

Figure 18: Bar chart represents the association between gender with the preference of types of chocolates.X-axis **represents** the student's gender and Y-axis represents the number of responses (preference of type of chocolates).Blue colour denotes regular light brown chocolates,Redcolour denotes dark brown chocolates and green colour denotes white

chocolates.Pearson's Chi square value=0.137,p value=0.998 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of males 74% (37) preferred dark chocolates.

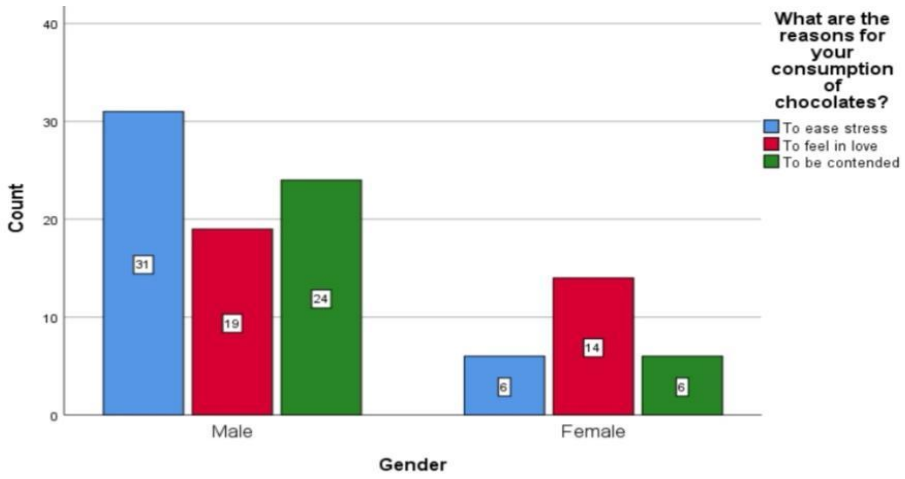

Figure 19: Bar chart represents the association between gender with the reason for consumption of chocolates.X-axis represents the student's gender and Y-axis represents the number of responses (reason for chocolate consumption).Blue colour denotes to ease stress,Redcolour denotes to feel in love and green colour denotes to be contended.Pearson's Chi square value=7.029,p value=0.078 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of males 74% (31) reason for chocolate consumption is to ease stress.

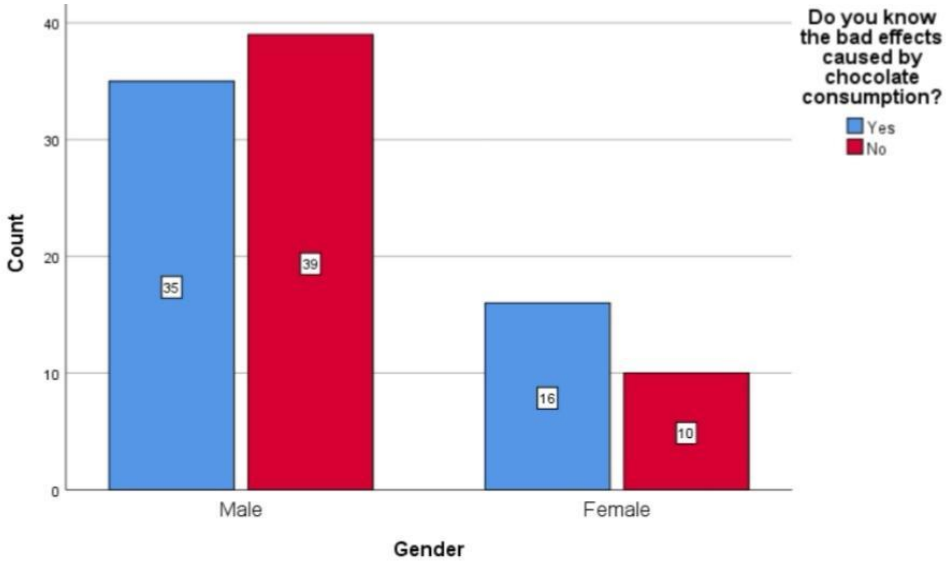

Figure 20: Bar chart represents the association between gender with awareness on bad effects caused by of types of chocolates.X-axis represents the student's gender and Y-axis represents the number of responses (bad effects caused by chocolate consumption).Blue colour denotes yes and Red colour denotes no.Pearson's Chi square value=0.137,p value=0.998 (p>0.05) hence statistically not significant.Although it is statistically not significant it is

implied that majority of males 74% (39) don't know the bad effects caused by chocolate consumption.

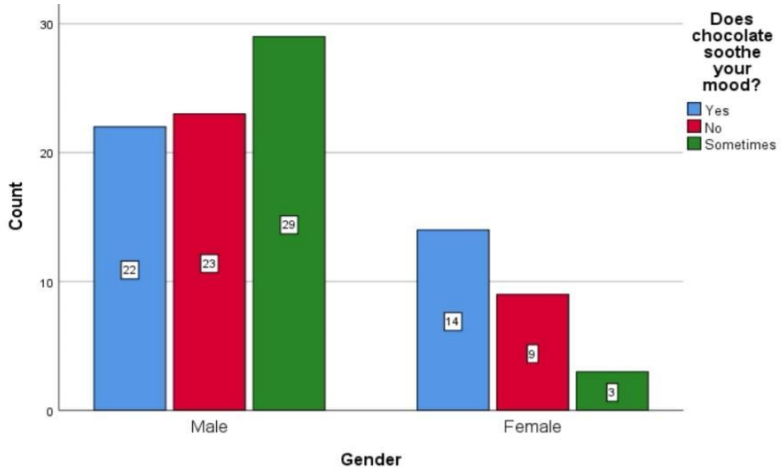

Figure 21:Bar chart represents the association between gender with soothness of mood by consumption of chocolates.X-axis represents the student's gender and Y-axis represents the number of responses (soothness of mood by chocolate consumption).Blue colourdenotes yes,Redcolour denotes no and green colour denotes sometimes.Pearson's Chi square value=7.780,p value=0.063 (p>0.05) hence statistically not significant.Although it is statistically not significant it is implied that majority of males 74% (29) mood is soothed by consumption consumption of chocolates.

LIMITATIONS

The limitations of **this** study are less sample sizes,Homogenous population and different region/general population needed.

FUTURE SCOPE

The future scope of this study is that Knowledge about the effects of consumption of chocolates and its influence on **overall** health of the body is imposed among school students.

CONCLUSION

According to the **above** survey we conclude that there is a high rate of chocolate consumption habits among the school students and hence there is an increased incidence of cavities. Awareness must be created among school students about the right way of consuming chocolates.Overall Teenagers of school students had a Higher consumption habits of chocolates.

ACKNOWLEDGEMENT

I thank saveetha dental college for their constant support and encouragement to carry out this work and **finish** the work on time.

CONFLICT OF INTEREST

No **conflict** of interest indeed.

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