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Dental Students' Perception Towards The Role Of Diet And Nutrition On Oral Health

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ABSTRACT:
Oral health is driven by a variety of factors affecting its health and illness. Poor oral health is associated with a wide range of chronic diseases including diabetes mellitus and cardiovascular diseases. There is a complementary relationship between oral health and nutrition There is no doubt as to the claim that diet plays a central role in the development of tooth decay. The present study was conducted to assess the dental students' knowledge and perception towards the role of diet and nutrition on oral health.

Materials and methods: The present study was a cross-sectional survey conducted among the dental undergraduates and postgraduates of a university in tamil nadu. A questionnaire containing 10 close-ended questions regarding diet and nutrition and its effect on dental caries and oral health was prepared.The data were collected and tabulated using the Microsoft Excel sheet. The recorded data were subjected to frequency distribution and Chi-square statistical tests using the IBM SPSS software version 22. The graphs were interpreted and the results obtained.

Results: A total of 100 responses were received out of which most of them were interns. 36% of the people counsel the patients always, 48% said sometime and 16 % said never. 58% had said that diet counselling will help in preventing dental caries, and 41% said maybe that they are not sure. In the present study, the majority (45%) of the participants reported sucrose to be the major factor causing dental caries.

Conclusion: According to the present study, the dental students have an excellent knowledge and perception towards the role of diet and nutrition on oral health.

KEYWORDS: Diet, dental students, oral health, nutrition, sugar, disease, innovative technique

INTRODUCTION:

Oral health is driven by a variety of factors affecting its health and illness. Dental conditions adversely affect the quality of life and negatively impact self-esteem, the ability to eat healthy, causing pain and anxiety(1,2). Tooth loss reduces nutritional diet, food enjoyment, and social interaction confidence(3,4). In oral and dental health, nutrition plays a crucial role. Oral health also affects the state of nutrition and diet(5). Poor oral health is associated with a wide range of chronic diseases including diabetes mellitus and cardiovascular diseases. Furthermore, low birth weight and preterm delivery were associated with poor oral health(6). However, good nutrition improves the development of healthy teeth & gums and reduces the risk of certain oral conditions(7).

In Miller's chemo-parasitic theory in 1890, dental caries were first outlined(8). Caries are caused by acid dissolution of the teeth by the metabolism of oral bacterial dietary carbohydrates. Diet and nutrition may interfere in several ways with the balance of tooth demineralisation(7).

According to the American Dietetic Association, "nutrition is an integral component of oral health."(9).There is a complementary relationship between oral health and nutrition There is no doubt as to the claim that diet plays a central role in the development of tooth decay. The human, animal and in vitro observations have clearly shown that frequent and prolonged exposure to some carbohydrates is crucial for the activities of caries(10).

Sugars enter the diet in two ways: naturally found in foods and added to foods during the processing process(11). Besides sugars, many factors influence the caries process. In general, sucrose is considered the primary cause of tooth decay(12). The cariogenic risk is lower in disaccharide when compared to sucrose. Dental plaque pH decreases due to organic acids during periods of demineralisation, which increases the solubility of calcium hydroxyapatite in hard dental tissues(13).The frequency and quantity of fermentable carbohydrates consumed may also have an impact on the duration(14,15).

Previous findings have shown that fresh fruit is preferred to fruit shakes and juices because chewing stimulates more saliva and promotes wash effects; and fruit juices may have extrinsic sugars and less pH that contribute to tooth erosion. As for the meal patterns, less frequent meals were recommended because of their effects on dental caries; similarly, eating dessert after meals is preferred as eating it after a period of time(16).

The effect of the diet and nutrition on oral health should be made known to the patients. Dental advice should be positive and personalised, if possible, for dental patients. In addition the frequency of intake of sugar foods should be encouraged to reduce.(17). A relatively low diet for additional sugars, fermentable carbohydrates and rich calcium cheese could also benefit tooth remineralisation. Adequate knowledge of diet and nutrition and its effects on oral health is necessary for dentists. Dental students can be targeted early on, as they are the phases of dentistry and transform their knowledge into private practise.

Our team has extensive knowledge and research experience that has translated into high quality publications(18),(19),(20),(21),(22,23) (24),(25–27). Having asserted the influence of diet and nutrition on dental caries, the present study was conducted to assess the dental students' knowledge and perception towards the role of diet and nutrition on oral health.

MATERIALS AND METHODS:

The present study was a cross-sectional survey conducted among the dental undergraduates and postgraduates of a university in tamilnadu. The total number of participants included in the study were 100 and the study was conducted in the month of March 2021. A questionnaire containing 10 close-ended questions regarding diet and nutrition and its effect on dental caries formation was prepared [Table 1]. The students were informed about the importance of the study and were included on a voluntary basis. The questionnaire was converted into an online survey using Google forms, and the links were forwarded to the participants.

Statistical analysis

The data were collected and tabulated using the Microsoft Excel sheet. The recorded data were subjected to frequency distribution and Chi-square statistical tests using the IBM SPSS software version 22 ($P \leq 0.05$).

Table 1. Questionnaire regarding students' perception towards the role of diet and nutrition on oral health.

S.no.	Questions	options
1	Year of study	1) 1st year 2) 2nd year 3) 3rd year 4) 4th year 5) Intern 6) PG
2	Do you think the role of diet and nutrition plays an important role in maintaining oral health?	1) Yes 2) No
3	Does tooth loss reduce the ability to eat nutritious food?	1) Yes 2) No

4	Caries are caused by?	1) Bacteria in the mouth 2) Frequent snacking 3) Consumption of sugary drinks 4) Not cleaning the teeth well 5) Dissolution of the teeth acid produced by the metabolism of dietary carbohydrates by oral bacteria
5	Which among the following is the most cariogenic sugar?	1) Lactose 2) Maltose 3) sucrose
6	Which of the following forms of food helps in preventing dental caries and strengthens periodontium?	1) Firm and fibrous food 2) Liquid food 3) Hard and sticky food
7	Which among the following psychological disorders affect the nutritional status and oral health of an individual?	1) Anxiety and panic attacks 2) Depression 3) Eating disorder 4) Schizophrenia and psychosis 5) Bipolar disorder
8	Which among the following elements present in trace amount in food is strongly cariostatic?	1) Fluoride 2) Calcium 3) iodine
9	Do you always counsel patients with high caries?	1) Always 2) Sometimes 3) never
10	Do you think diet counseling can help prevent dental caries ?	1) Yes 2) No 3) maybe

RESULTS

The results obtained from the circulated questionnaire are given as follows. The following graphs are plotted in SPSS software. The graphs are interpreted and the results are obtained.

A total of 100 responses were received out of which most of the were interns .The following conclusions were made from the results and was expressed with the help of pie charts and association, if any, with bar diagrams. 4% were first year, 17% were second year, 15 % were third-year, 21 % were fourth year, 26% were interns and 17% were PG.Here the final year students were the majority and 1 st year students were the minority (fig 1).

About the importance of the role of diet and nutrition on oral health , 93% said yes , that it is important and 7% said that it's not important (fig 2). 89% have said that tooth loss reduces the ability to eat nutritious food and 11% have said no to it (fig 3). 16% say that caries is caused by bacteria in the mouth, 21% said it's due to frequent snacking, 25% said that caries is due to sugary drinks, 11% answered no proper cleaning of teeth and the majority 27% answered that its due to the dissolution of the acid present in the teeth(fig 4).

The majority (45 %) answered correctly that the most cariogenic sugar is sucrose whereas 24% said lactose and 31% said maltose(fig 5). For the food which strengthens the periodontium, 47% correctly answered as firm and fibrous food, 41 % said liquid food and 12% said hard and sticky food (fig 6). The physiological disorder which affects the nutritional status is eating disorder which 30% answered correctly, 19% said it is panic attack, an equal proportion of people (24%) said that it is depression and schizopenia - psychosis and 3% said bipolar(fig 7).

57% said fluoride as the strong cariostatic element in food , 36 % said calcium, 7% said iodine (fig 8). 36% of the people counsel the patients always, 48% said sometime and 16 % said never (fig 9). 58% had said yes that diet counselling will help in preventing dental caries, 1% said no and 41% said maybe that they are not sure(Fig 10).

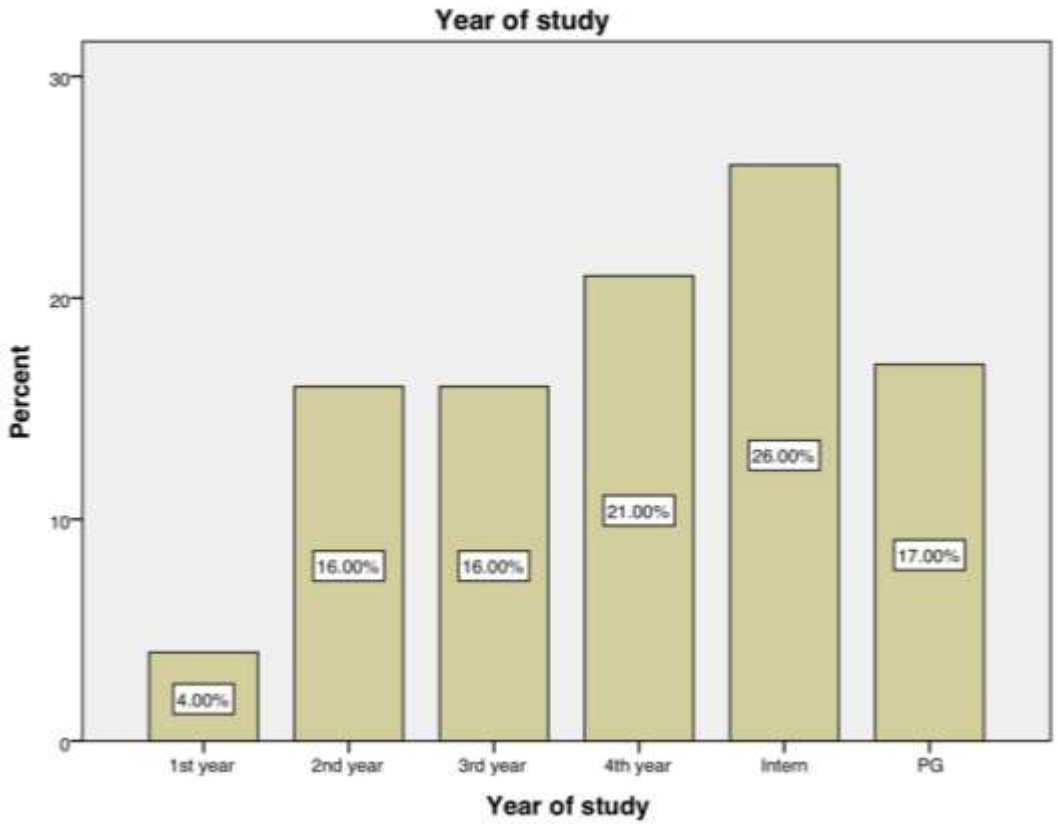


Fig 1: Bar graph representing the distribution of the participants according to the year of study. Here x axis denotes year of study and y axis denotes percentage of responses.1st year(4%), 2nd year(17%), 3rd year(15%), 4th year(21%), interns (26%) and post graduates (17%).

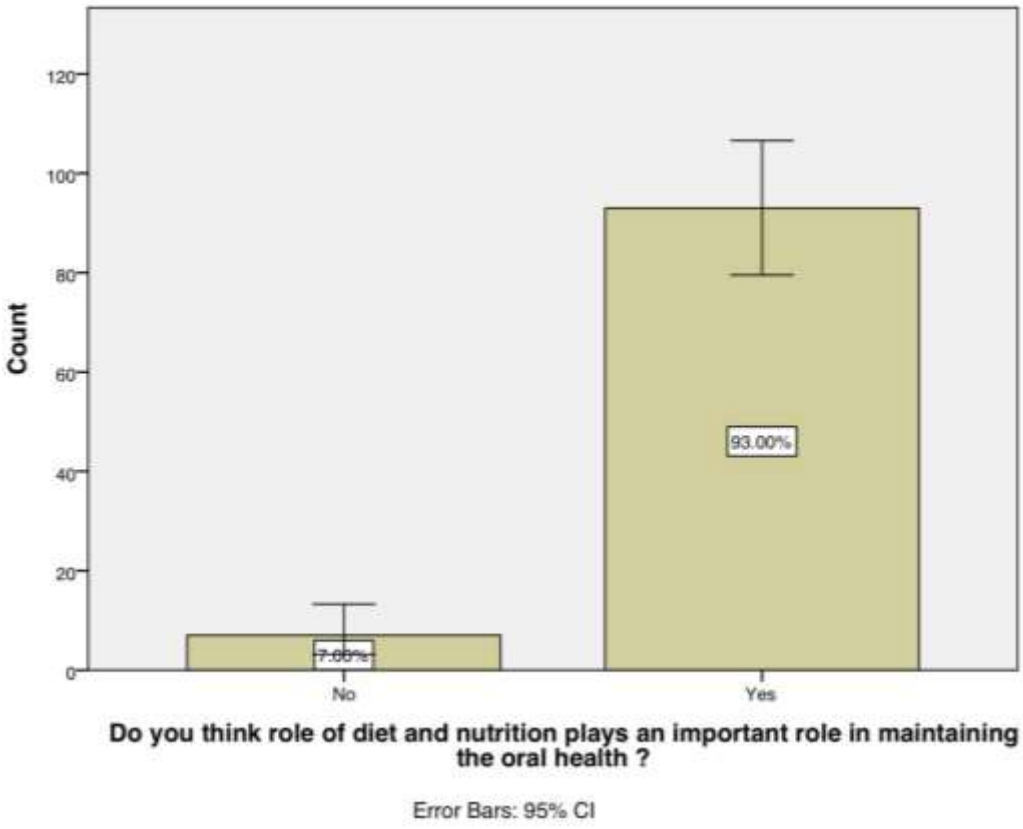


Fig 2 : Bar graph representing the distribution of the study participants' response to the important role of diet and nutrition on oral health.

Here x axis denotes study participants' response to the important role of diet and nutrition on oral health and y axis denotes percentage of responses .Here most of them have responded that yes the role of diet and nutrition plays an important role in oral health (93%) and and some have said no (7%).

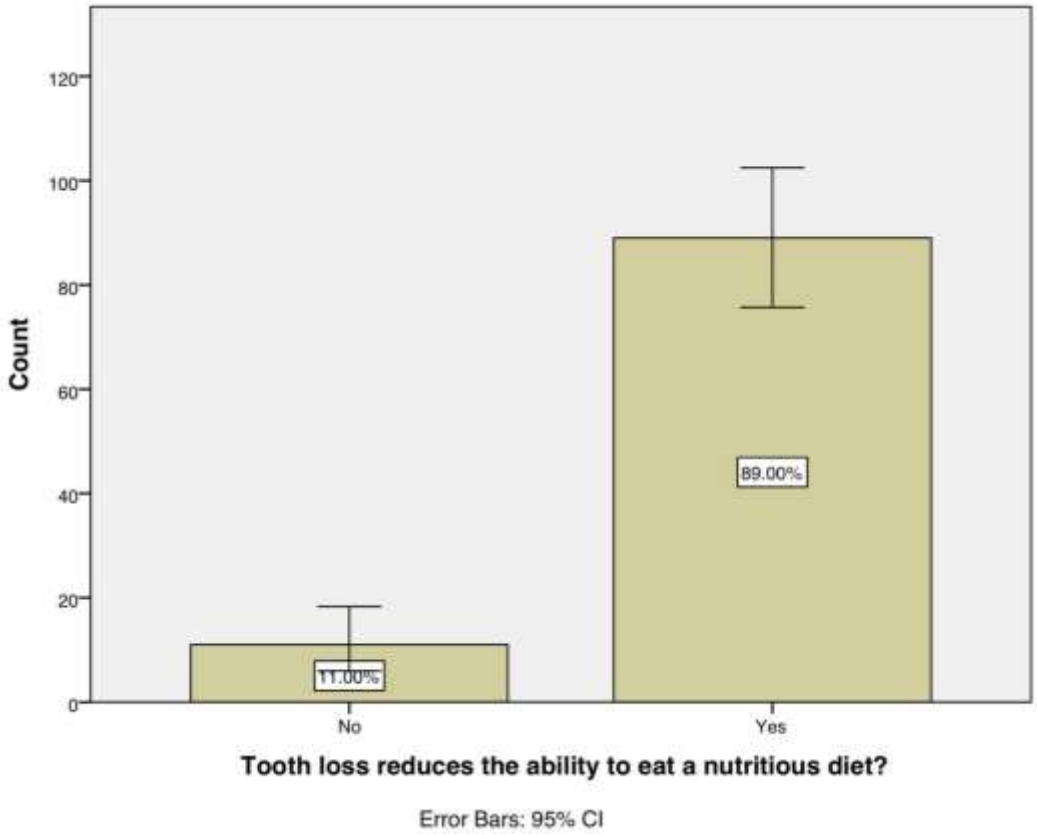


Fig 3 : Bar graph representing the distribution of the study participants' response to the question if tooth loss reduces the ability to eat nutritional food

Here x axis denotes study participants' response to the question if tooth loss reduces the ability to eat nutritional food y axis denotes percentage of responses. Majority of the agreed that tooth loss reduces the ability to eat a nutritional food (89%) and a few people have said no (11%).

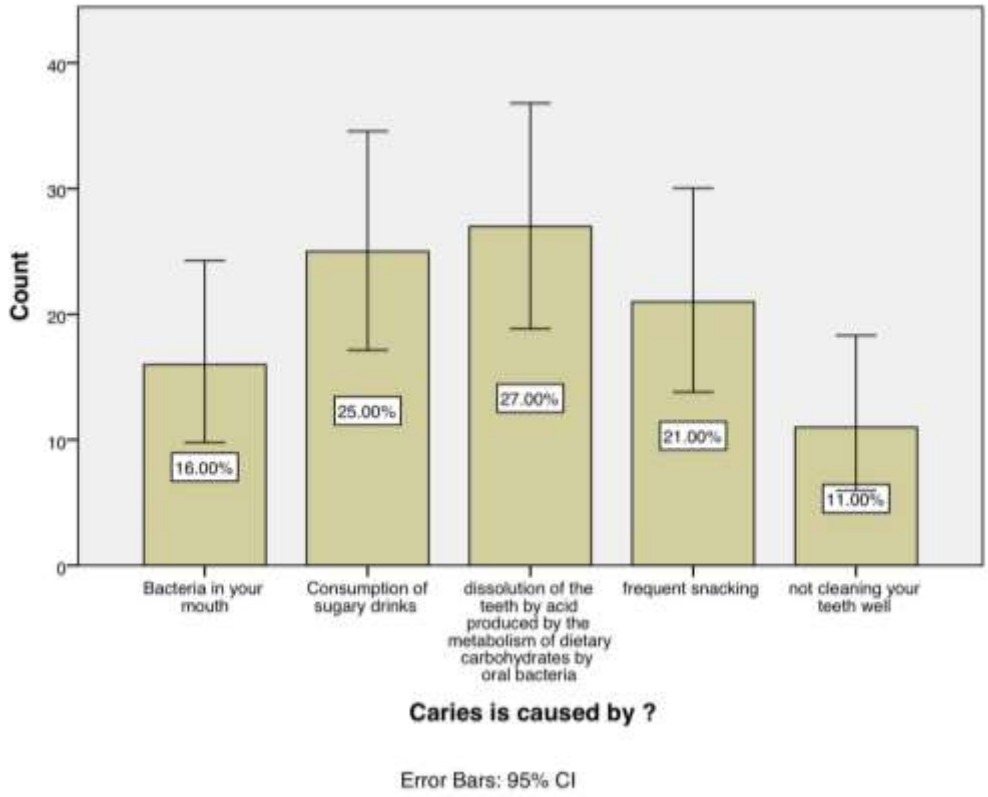


Fig 4 : Bar graph representing the distribution of the study participants' response to the etiology of the dental caries.

Here x axis denotes study participants' response to the etiology of the dental caries.y axis denotes percentage of responses.Here bacteria in the mouth was chosen by (16%), frequent snacking (21%), consumption of sugary drinks (25%), no proper cleaning of teeth (11%) and dissolution of teeth acid was chosen by the majority of the people (27%) .

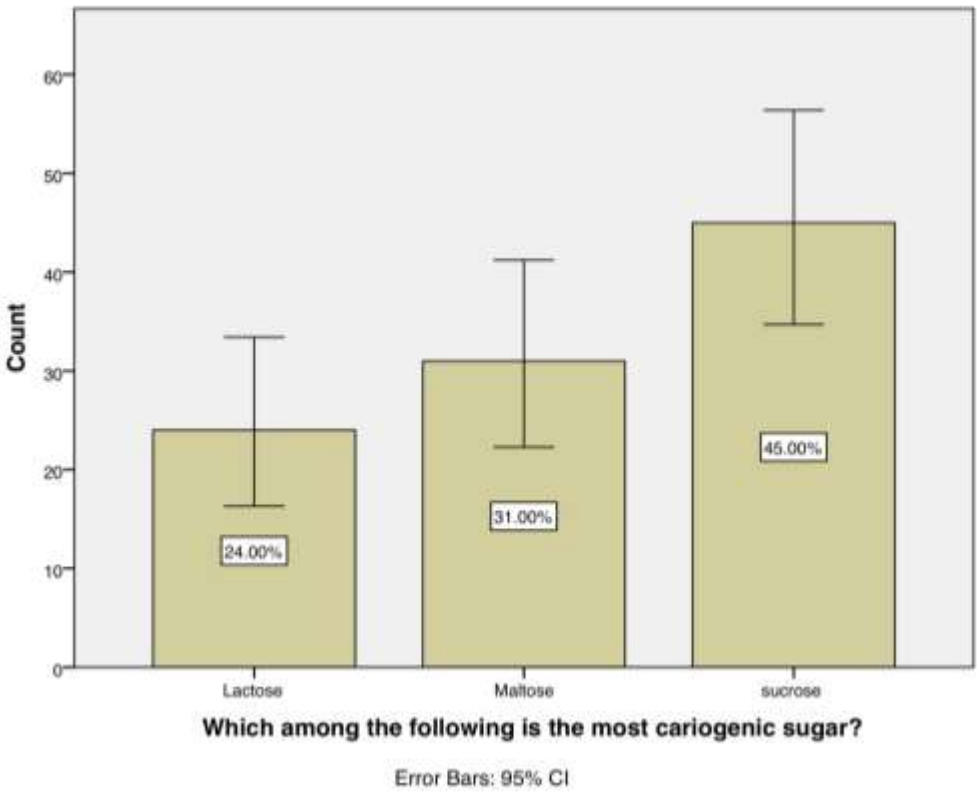


Fig 5: Bar graph representing the distribution of the study participants' response to the most cariogenic sugar.

Here x axis denotes study participants' response to the most cariogenic sugar .y axis denotes percentage of responses ,lactose was chosen by 24%, maltose (31%) and majority of them chose sucrose(45%).

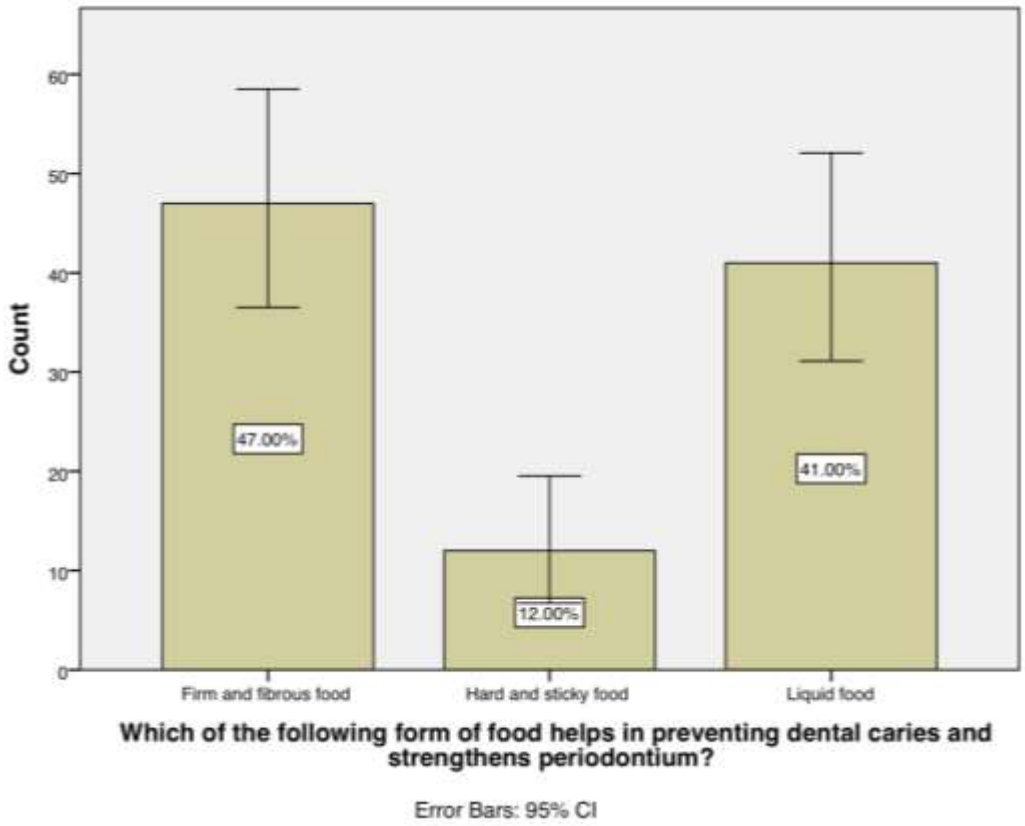


Fig 6: Bar graph representing the distribution of the study participants' response to the food that will prevent dental caries and strengthen the periodontium.

Here x axis denotes study participants' response to the food that will prevent dental caries and strengthen the periodontium .y axis denotes percentage of responses.Here majority of the have chosen firm and fibrous food (47%), few opted liquid food (41%) and very few people chose hard and sticky food (12%).

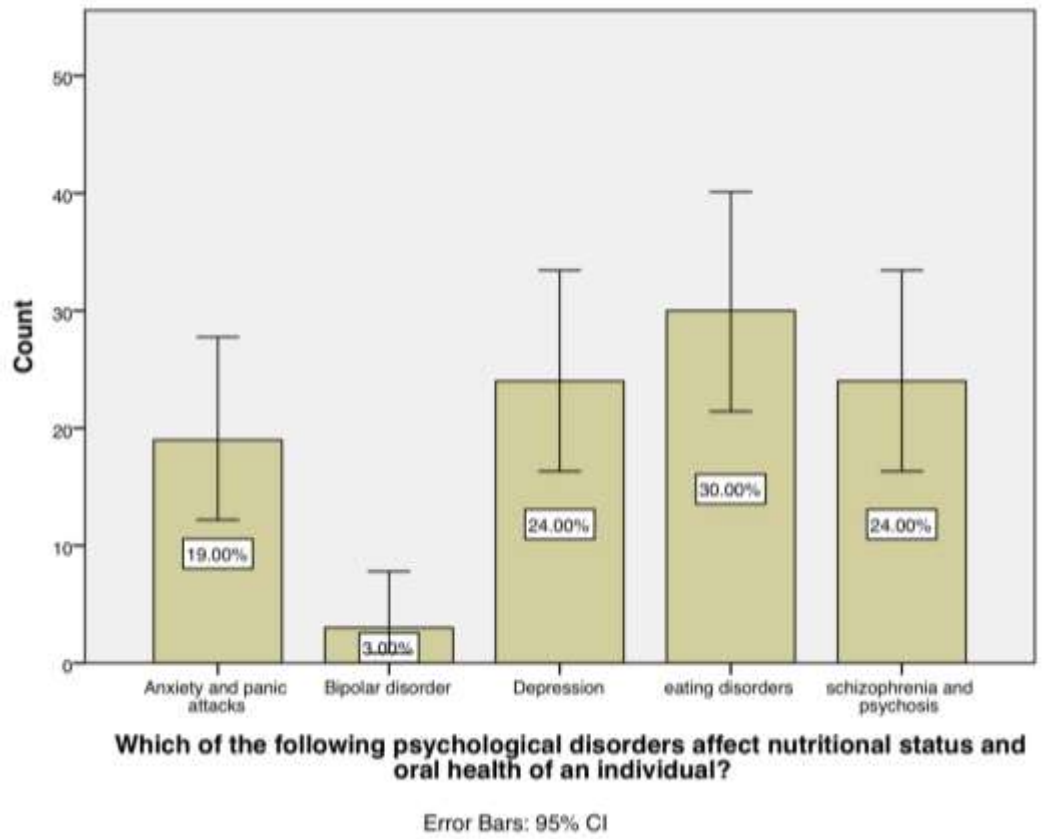


Fig 7 : Bar graph representing the distribution of the study participants' response to psychological disorder which affects the nutritional status and oral health of the individual.

Here x axis denotes study participants' response to psychological disorder which affects the nutritional status and oral health of the individual. y axis denotes percentage of responses. The responses were mixed , anxiety and panic attacks (19%), depression (24%), eating disorder (30%), schizopenia and psychosis(24%) and the minority was for bipolar disorder (3%) .

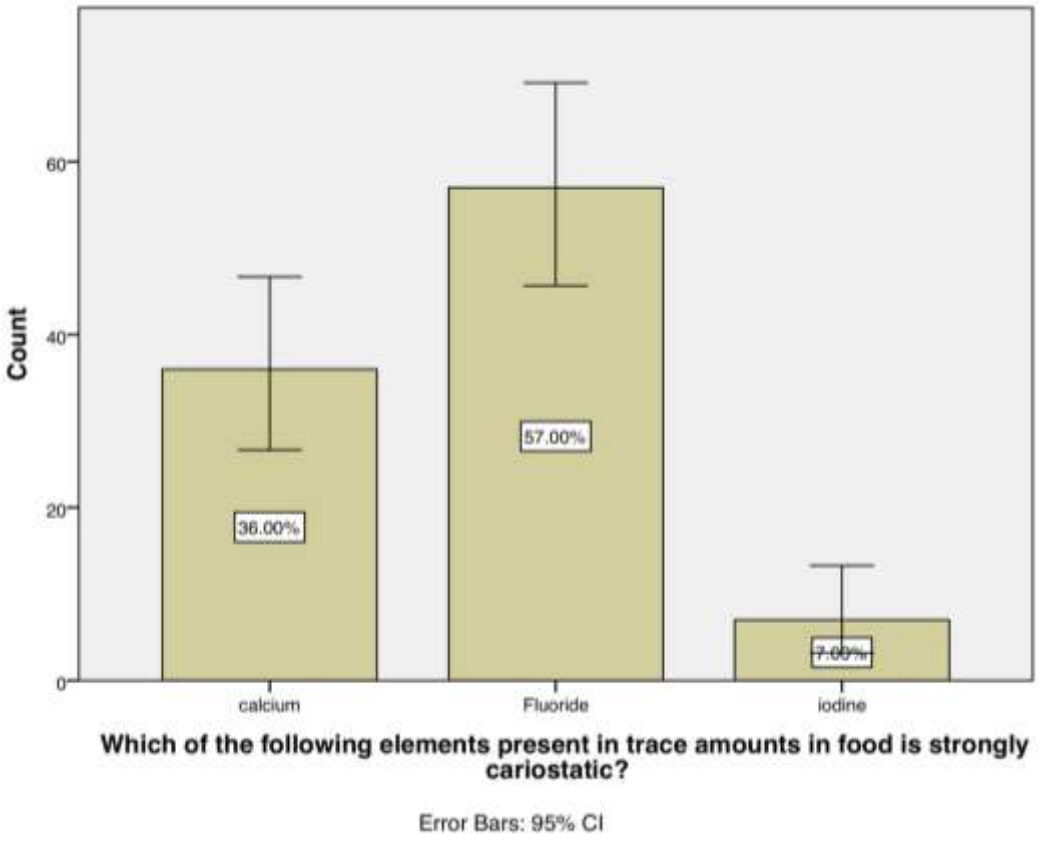


Fig 8: Bar graph representing the distribution of the study participants' response to the strong cariostatic element present in food.

Here the x axis denotes study participants' response to the strong cariostatic element present in food. y axis denotes percentage of responses, where most of the. Opted fluoride (57%), some opted calcium(36%) and a very few opted iodine (7%).

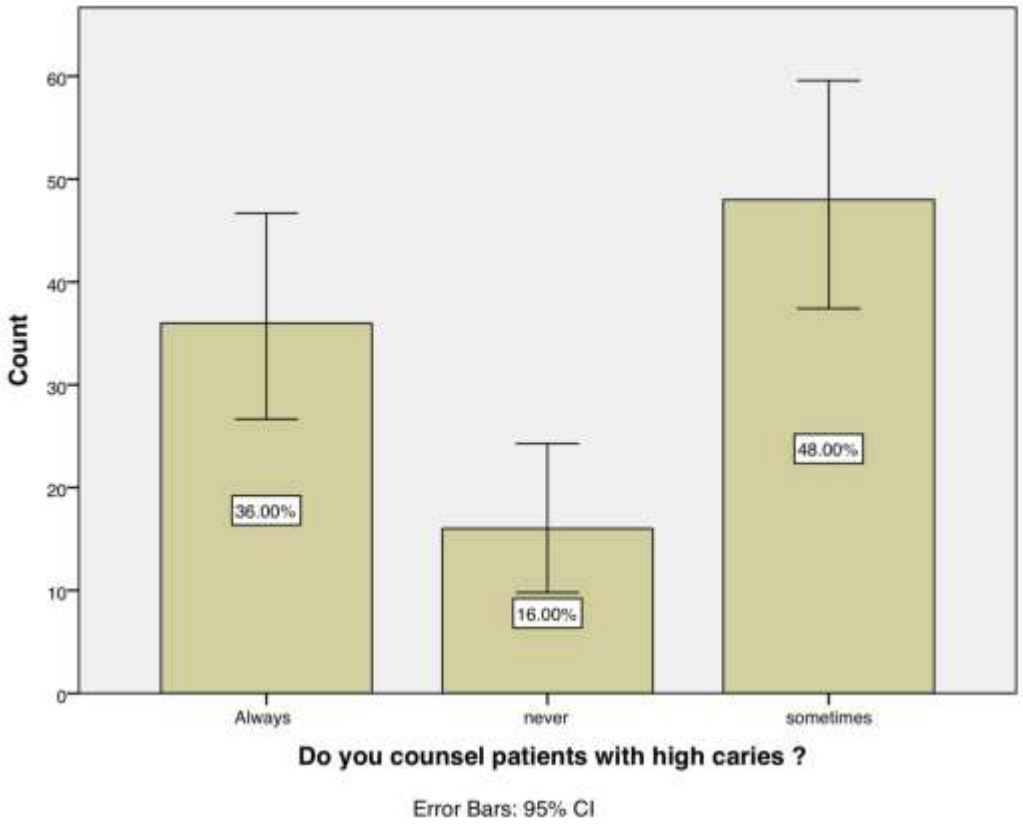


Fig 9: Bar graph representing the distribution of the study participants' response to whether they counsel patients with high caries.

Here the x axis denotes study participants' response to whether they counsel patients with high caries. y axis denotes percentage of responses, Here 36% answered always they counsel patients with high caries , 48% answered sometimes , and never they counsel patients with high caries was 16%

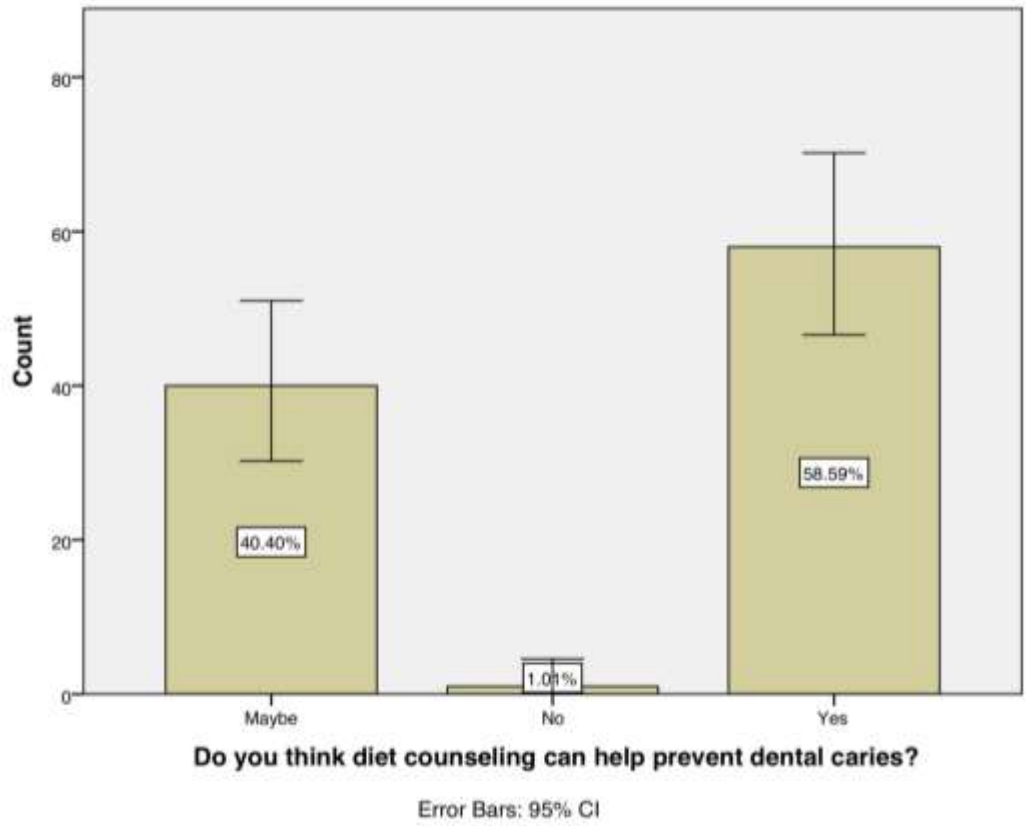
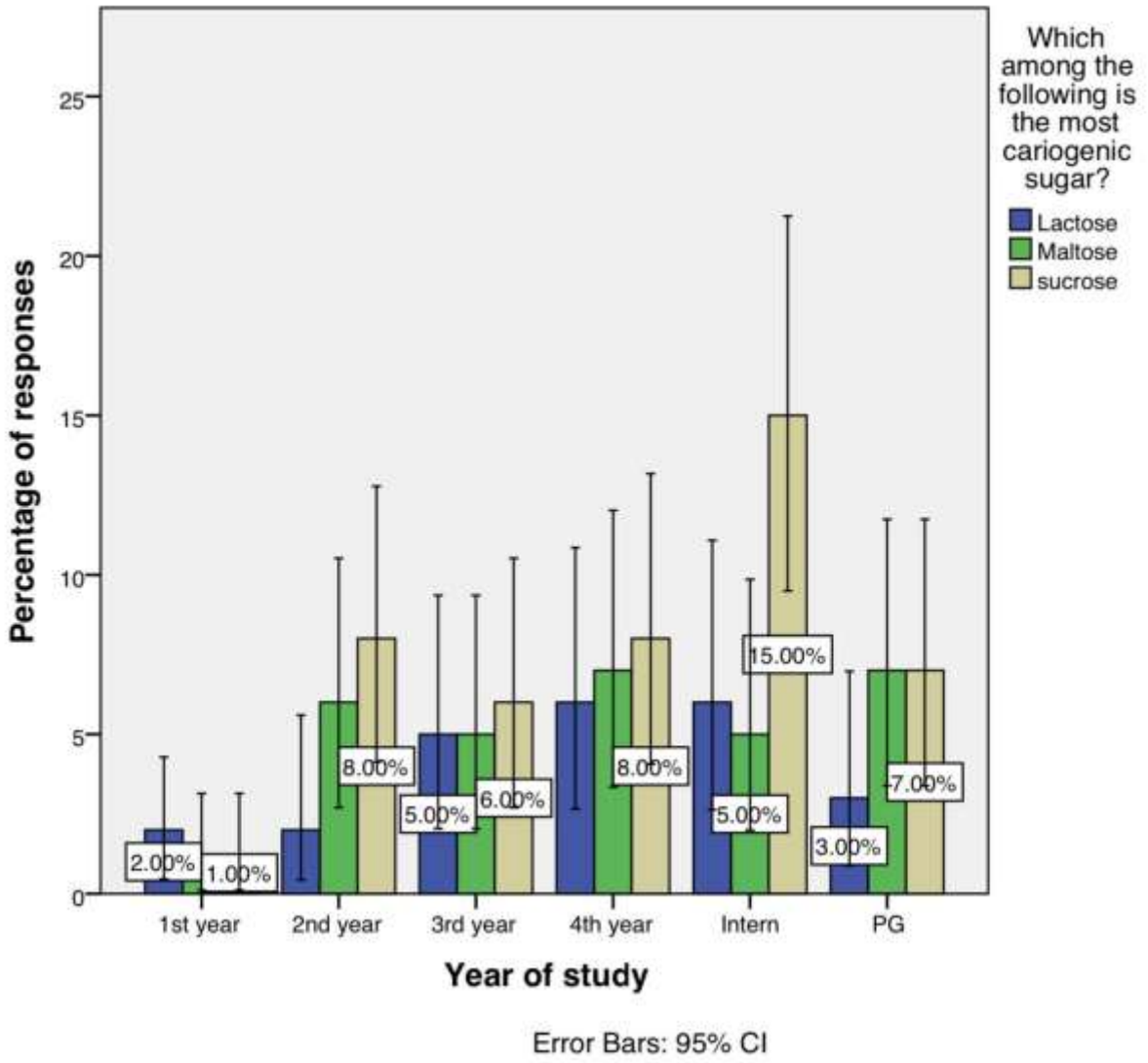
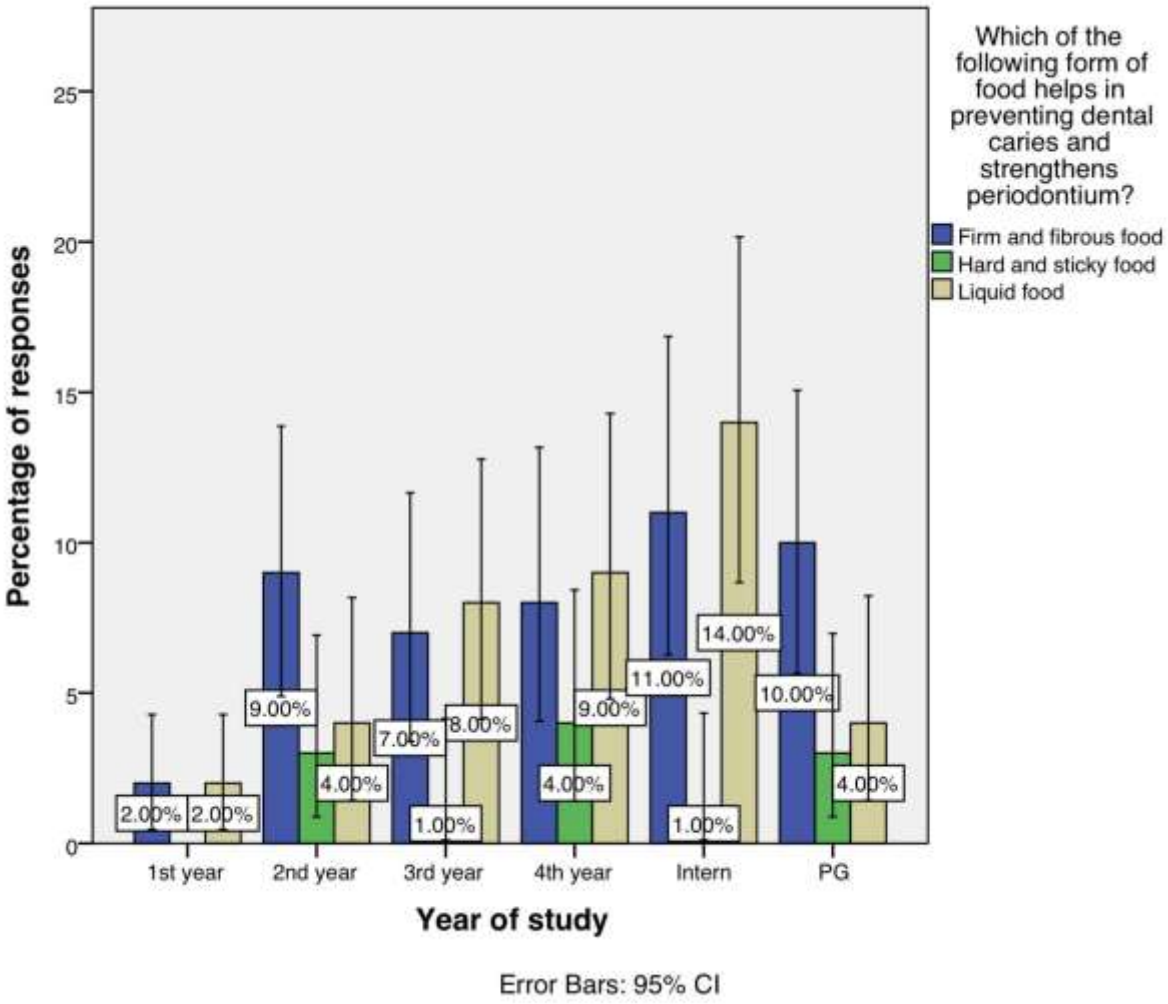


Fig 10: Bar graph representing the distribution of the study participants' response to whether diet counselling will help in preventing dental caries .

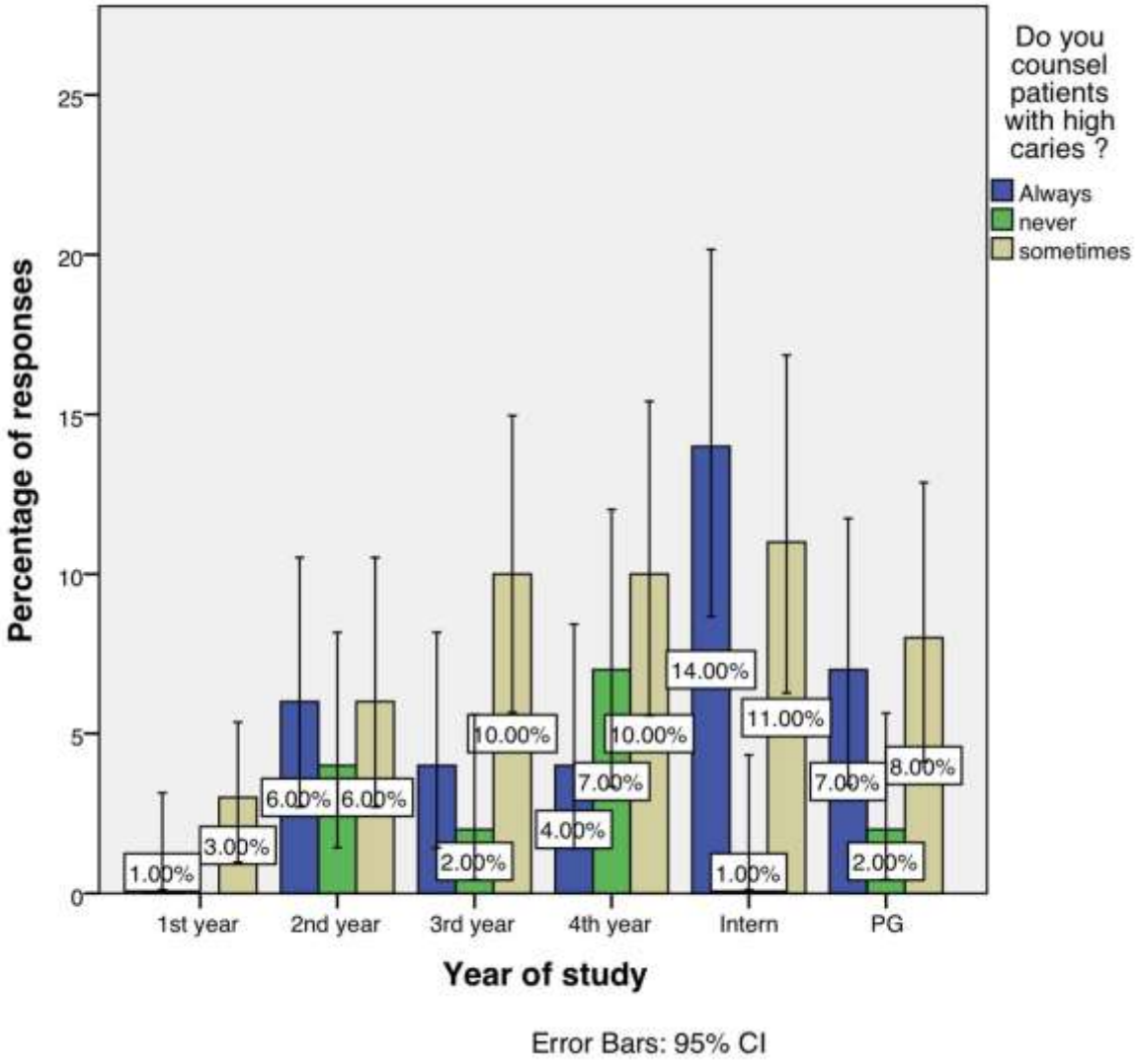
Here the x axis denotes study participants' response to whether diet counselling will help in preventing dental caries . y axis denotes percentage of responses where majority of the answered yes that diet counselling helps to prevent dental caries (58%), very few said no(1%), and some answered maybe (41%)



Graph 11: Barchart shows the association between various years and the most cariogenic sugar. X axis represents year of study and Y axis represents frequency distribution of the most cariogenic sugar. Blue colour denotes lactose, green colour denotes maltose and brown denotes sucrose.Chi square test was done and the association was found to be not significant.(p value was =0.757 p >0.05 statistically not significant).



Graph 12: Barchart shows the association between various years and the form of food which helps in preventing dental caries. X axis represents year of study and Y axis represents frequency distribution form of food which helps in preventing dental caries . Blue colour denotes firm and fibrous food , green colour denotes hard and sticky food and brown denotes liquid food. Chi square test was done and the association was found to be not significant.(p value was =0.045 $p < 0.05$ statistically significant).



Graph 13: Barchart shows the association between various years and whether they counsel patients with high caries. X axis represents year of study and Y axis represents frequency distribution of responses for the question,do u counsel patients with high caries. Blue colour denotes always, green colour denotes never and brown denotes sometimes.Chi square test was done and the association was found to be not significant.(p value was =0.645 p >0.05 statistically not significant).

DISCUSSION:

The importance of diet and nutrition for general health has been emphasised in different fields by professionals. However, not many studies among dental students about the perception of the role of diet and nutrition on oral health were found. In addition, comparisons were not made between years of study. The present study was conducted to know the dental students' perception towards the role of diet and nutrition on oral health. The study concluded that 99 (99%) participants from 100 believed that diet counseling could help in the prevention of dental caries.

In the present study, the majority (45 %) of the participants reported sucrose to be the major criminal of caries. This was similar to the study conducted by fhelen and almost similar to that of sivakumar in a study conducted among dental students in India, regarding their perception of diet counseling. Most of the students (82%) reported sucrose as the most cariogenic sugar in the study by Fhelen *et al.* and 64% in a study by Sivakumar *et al.(28,29)*

Some human studies show that the frequency of sugar intake is an important etiological factor for caries development(30,31). There is already an indication that both the frequency and amount of sugar consumed are linked to dental caries(32–34).

The Vipeholm study provides the main evidence for the belief(35) that the frequency with which sugar is consumed is directly relevant to the prevalence of dental caries. These findings were consistent with the findings of our study, with 45% percent of participants associating the frequency of sugar consumption with the occurrence of dental caries.

The calcium concentration of dental plaque strongly influences the balance between demineralization and remineralization of enamel.(36) In our study, 57% answered correctly that the strongest cariostatic element present in trace amounts is fluoride which correlates with the study of Manal (5).

The present study shows a constructive attitude towards dietary consultation for a majority (99%) of students to avoid dental caries. Carole et al. published similar results whose dental students typically displayed a positive approach to their patients' diet and dietary advice.(37). Two trials with caries-active persons have also shown a reduction of caries in dietary therapy and improvement of 85% and 60%(38,39).

CONCLUSION:

The present study suggests that the dental students have an excellent knowledge and perception towards the role of diet and nutrition on oral health. Dietary therapy focuses mostly on disease control. But health advocacy, disease prevention and comprehensive health care should be the priority. For recognition of dietary risks, dentists can be called "gatekeepers," and patients referred to dieticians and doctors for further treatment when indicated. These visits may also provide an opportunity to enhance lifestyle and oral hygiene, as well as serve as a source of encouragement for patients to make meaningful improvements in their general and dental health through dietary changes.

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Source of Interest: Self

Ethical Clearance- Not Required

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