

Knowledge and Awareness on the Role of Diet and Dental Caries Among Dental Students

Akifa begum

Saveetha Dental college,
Saveetha Institute of Medical and Technical Science,
Saveetha University, Chennai, India
Email: 151901022.sdc@saveetha.com

Archana Santhanam

Assistant Professor,
Department of Oral Pathology,
Saveetha Dental College,
Saveetha Institute Of Medical and Technical Sciences,
Saveetha University, Chennai, India

G. Sridevi

Associate Professor,
Department of Physiology,
Saveetha Dental College,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University, Chennai

Corresponding Author

Archana Santhanam,

Assistant Professor,
Department Of Oral Pathology,
Saveetha Dental College,
Saveetha institute of Medical and Technical Science
Saveetha University,
162, Poonamallee High Road,
Chennai-600077
Tamilnadu, India
Email: drarch.s@gmail.com
Phone No: 9962149330

ABSTRACT:

Introduction: Oral health is related to diet in many ways, it is known that any food containing fermentable carbohydrates may potentiate the incidence of dental caries. Diet affects the integrity of teeth, salivary pH and plaque pH.

Aim: The aim of the study is to assess the knowledge and awareness on the role of diet and dental caries among dental students.

Materials and methods: A descriptive cross sectional survey was conducted among 120 dental students from March to April 2020 through a self administered questionnaire. The

responses were collected, tabulated in excel sheet and analysed using SPSS software. Chi square test was used to analyze the level of knowledge on diet and dental caries among dental students with statistical significance of $P < 0.05$.

Results: the 3rd year undergraduate dental students had high knowledge on the role of diet and dental caries compared to others. 42.5 % of the participants were aware of the effect of diet counselling preventing dental caries with the p value of 0.045, which is statistically significant.

Conclusion: This study concludes that the dental students have a good knowledge and awareness on the role of diet and dental caries.

Keywords: Awareness; dental caries; diet; oral health

INTRODUCTION:

The current definition of oral health involves the ability to convey a range of emotions through facial expressions without pain and discomfort. Dietary practises, especially the consumption of free sugars are recognised as a common risk factor for the occurrence of non communicable diseases [(Lin, 2018)]. The relationship between dietary proteins and dental caries has been suggested and reinforced since the 1950's [(Badrasawi *et al.*, 2020)]. In the last 10 years, evidence has demonstrated that dietary practises particularly, the consumption of free sugars, are of critical importance to the development of dental caries [(Ahad and Gheena, 2016)]. The effect of diet on the dental caries essentially refers to the local effect of carbohydrates on dental tissues that are metabolised by cariogenic microorganisms in the oral cavity [(Sarbeen, Insira Sarbeen and Gheena, 2016)]. Early dietary patterns may influence the bacterial ecology, such as the establishment of the mutants group, streptococci which is a strong predictor of future caries in young children [(Punitha *et al.*, 2015)] [(Youssefi and Afroughi, 2020)]. In general, dietary preferences are associated with foods with high energy densities, which are rich in sugar, fat and sodium. Untreated oral diseases frequently leads to general health problems. Nowadays due to mechanical life, people often neglect their oral health [(Seccombe, 1924)]. In developing countries changes in lifestyles and dietary patterns increase the caries incidence. As oral diseases are largely preventable, it is hoped that with the early exposure to oral health maintenance, the prevalence of dental caries will be reduced [(Palati *et al.*, 2020)]. Behaviour of an individual, cultural and social practises are an important determinant for caries risk. [(Munjal *et al.*, 2018)]. In most of the industrialised countries, people with high risk of caries are found in the lower socioeconomic status and immigrant groups. Mostly, the dental caries start with indication of tooth sensitivity [(Gunasekaran and Abilasha, 2016)]. Various forms of fluoride therapy and dental sealants are used as a prophylactic measure to prevent caries. Nutrition value on oral and dental health plays a vital role in preventing oral diseases and related problems. Previously our team had conducted numerous original studies [(Hannah, Ramani, Sherlin, *et al.*, 2018; Padavala and Sukumaran, 2018; Hema Shree *et al.*, 2019; Manohar and Abilasha, 2019; Palati *et al.*, 2019, 2020)] and surveys [(Ahad and Gheena, 2016; Prasanna and Gheena, 2016; Sarbeen, Insira Sarbeen and Gheena, 2016; Krishnan *et al.*, 2018; Sheriff and Santhanam, 2018; Abitha and Santhanam, 2019; Harrita and Santhanam, 2019; Uma *et al.*, 2020)] over the past 5 years. Now we are focusing on epidemiological surveys. The idea for this survey stemmed from the

current interest in our community. The main aim of the present study is to assess the level of knowledge and awareness on the role of diet and dental caries among dental students.

Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Ariga *et al.*, 2018; Basha, Ganapathy and Venugopalan, 2018; Hannah, Ramani, Herald. J. Sherlin, *et al.*, 2018; Hussainy *et al.*, 2018; Jeevanandan and Govindaraju, 2018; Kannan and Venugopalan, 2018; Kumar and Antony, 2018; Manohar and Sharma, 2018; Menon *et al.*, 2018; Nandakumar and Nasim, 2018; Nandhini, Babu and Mohanraj, 2018; Ravinthar and Jayalakshmi, 2018; Seppan *et al.*, 2018; Teja, Ramesh and Priya, 2018; Duraisamy *et al.*, 2019; Gheena and Ezhilarasan, 2019; Hema Shree *et al.*, 2019; Rajakeerthi and Ms, 2019; Rajendran *et al.*, 2019; Sekar *et al.*, 2019; Sharma *et al.*, 2019; Siddique *et al.*, 2019; Janani, Palanivelu and Sandhya, 2020; Johnson *et al.*, 2020; Jose, Ajitha and Subbaiyan, 2020).

MATERIALS AND METHODS:

Study design

A cross sectional study was conducted through an online survey from March to April 2020 among undergraduate dental students of private dental institutions, Chennai.

Study subjects

A simple random sampling was used to select the study participants. Among 120 participants, 63 participants belong to third year, 15 participants belong to fourth year and 42 participants belong to intern.

Inclusion criteria

Undergraduate dental students of private dental institutions who were willing to participate were included.

Ethical consideration

Returning the filled questionnaire was considered as implicit consent with no need for signing a written consent. Ethical approval for the study is obtained from the institutional review board (IRB).

Study method

A self administered questionnaire consisting of 10 questions was prepared and was distributed in the form of an online survey among the dental students. The survey was distributed via an online platform, 'google forms'. Demographic details were also included in the questionnaire. The collected data was checked regularly for clarity, competence, consistency, accuracy and validity.

Statistical analysis

Data was analysed with SPSS version 22.0. Descriptive statistics as number and percent were calculated to summarise the qualitative data. Chi square test was used to analyze and compare the education level of students and their knowledge on the role of diet and dental caries. The confidence level was 95% and of statistical significance $P < 0.05$. Finally, the result was presented by using bar charts and frequency tables.

RESULTS:

The present study included 57% male participants and 43% female participants. Among the undergraduate dental students, 52.8% of the participants were 3rd year undergraduate dental students, 14.6% of the participants were 4th year undergraduate dental students and 32.6% of the participants were interns.

From the present study, dental students were aware that sucrose was the most cariogenic sugar. From the present study, the majority responded that aspartame (45%), followed xylitol (35%) as a sugar substitute which reduces the chances of dental caries. From the present study, nuts were considered as anti-cariogenic (55.8%). From the present study, most of the undergraduate dental students agreed that liquid food was the form of food that helps in preventing dental caries and strengthens periodontium(46.7%). Both vitamin C and B12 deficiencies and iron deficiency manifest as oral symptoms, which is the maximum response, given by the undergraduate dental students (45%). With hereditary lactose intolerance an individual would have no decay (52.3%). From the present study, dental students were aware that 'fluoride' in trace elements in food was strongly cariostatic (40.8%). 42.5% of the undergraduate dental students believed that diet counselling can minimise the risk of dental caries. (table 1)

DISCUSSION:

Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

From the present study, it is evident that sucrose was the most cariogenic sugar (figure 1), where the maximum response was 45% by the 3rd year undergraduate dental students with P value = 0.056 which is statistically insignificant. Similar findings were found in the study conducted by Ferdens et al [(Verma *et al.*, 2016)]. There are no previous articles with opposing findings. Sucrose is an important etiological factor which causes dental caries.

From the present study, it was evident that the majority responded that aspartame (45%), followed xylitol (35%) as sugar substitute which reduces the chances of dental caries (figure 2), with maximum response for xylitol was given by the 4th year undergraduate dental students (45.8%) with a P value $0.046 < 0.05$ which is statistically significant (figure 3). Similar study was done by Mariam al mannai et al. There are no previous articles with opposing findings. Xylitol is the answer as it inhibits the growth of bacteria which causes cavities [(Musaiger, Al-Mannai and Abduljawad, 2014)].

From the present study, it was evident that nuts were considered as anti-cariogenic (55.8%) where the majority of 3rd year undergraduate dental students responded the same with P value $0.112 > 0.05$ which is statistically insignificant (figure 4). A similar study was done by Mariam al mannai et al with a similar finding. There are no previous articles with opposing findings. Nuts, being rich in protein food does not cause dental caries [(Musaiger, Al-Mannai and Abduljawad, 2014)].

From the present study, it is evident that liquid food (46.7%) was the form of food that helps in preventing dental caries and strengthens periodontium, majority of the 3rd year undergraduate dental students responded the same with P value = $0.032 < 0.05$, which is statistically significant (figure 5). There was a similar finding in the study done by Mariam al mannai et al. There are no previous articles with opposing findings. Liquid food reduces inflammation and battles the gum diseases [(Musaiger, Al-Mannai and Abduljawad, 2014)].

From the present study, it is evident that both vitamin C and B12 deficiencies and iron deficiency manifest as oral symptoms, which is the maximum response, given by the 3rd year undergraduate dental students (45%) with P value = 0.012 which is statistically significant (figure 6). There was a similar finding by faldens et al. There are no previous articles with opposing findings. Both the deficiencies are the reason since they cause scurvy and give sore oral cavities [(Bagramian and Russell, 1973)].

With hereditary lactose intolerance an individual would have no decay . Majority of 3rd year undergraduate dental students responded the same (52.3%) with P value =0.325 which is statistically insignificant (figure 7). There was a similar finding by feldens et al. There are no previous articles with opposing findings. Having lactose intolerance gives no decay issues as the individual does not consume lactose rich foods which are highly cariogenic [(Bagramian and Russell, 1973)].

From the present study, it is evident that, 'fluoride' in trace elements in food is strongly cariostatic (40.8%) (figure 8), where the 3rd year undergraduate dental students had better knowledge compared to other students with P value= 0.022 which is statistically significant (figure 9). There was a similar finding by Mariam al mannai et al. There are no previous articles with opposing findings. When fluoride content is high, it is cariostatic [(Musaiger, Al-Mannai and Abduljawad, 2014)].

42.5% of the 3rd year undergraduate dental students believed that diet counselling can minimise the risk of dental caries (figure 10) with P Value 0.456>0.05, which is statistically insignificant (figure 11). There was a similar finding by mariam al mannai et al. Diet counselling can help prevent dental caries as it focuses mainly on eating habits, which plays an efficient role in maintenance of oral health and oral cleanliness [(Musaiger, Al-Mannai and Abduljawad, 2014)].

The limitation of this study was biased sampling, equal number of participants can be included from different years of study to get more accuracy in the results. The future scope of this study is that it can be expanded widely to include an equal number of participants to assess the awareness and knowledge on the role of diet and dental caries.

CONCLUSION:

This study concludes that the knowledge and awareness on the role of diet and dental caries was found to be moderate. On comparing different education levels, third year undergraduate dental students had good knowledge and awareness regarding the role of diet and dental caries compared to other students.

ACKNOWLEDGEMENT:

The authors would like to thank the study participants for their participation and kind cooperation throughout the study.

AUTHOR CONTRIBUTIONS:

Akifa Begum : Literature search, survey, data collection, analysis, manuscript writing

Dr. Archana Santhanam : Study design, data verification, manuscript drafting

CONFLICTS OF INTEREST:

The authors declare that there are no conflicts of interest in the present study

REFERENCES:

1. Abitha, T. and Santhanam, A. (2019) 'Correlation between bizygomatic and maxillary central incisor width for gender identification', *Brazilian Dental Science*, 22(4), pp. 458–466.
2. Ahad, M. and Gheena, S. (2016) 'Awareness, attitude and knowledge about evidence based dentistry among the dental practitioner in Chennai city', *Research Journal of Pharmacy and Technology*, 9(11), pp. 1863–1866.
3. Ariga, P. *et al.* (2018) 'Determination of correlation of width of Maxillary Anterior Teeth using Extraoral and Intraoral Factors in Indian Population: A systematic review', *World journal of dentistry*, 9(1), pp. 68–75.
4. Badrasawi, M. M. H. *et al.* (2020) 'Nutrition Awareness and Oral Health among Dental Patients in Palestine: A Cross-Sectional Study', *International journal of dentistry*, 2020, p. 3472753.
5. Bagramian, R. A. and Russell, A. L. (1973) 'Epidemiologic study of dental caries experience and between-meal eating patterns', *Journal of dental research*, 52(2), pp. 342–347.
6. Basha, F. Y. S., Ganapathy, D. and Venugopalan, S. (2018) 'Oral hygiene status among pregnant women', *Journal of advanced pharmaceutical technology & research*, 11(7), p. 3099.
7. Chandrasekar, R. *et al.* (2020) 'Development and validation of a formula for objective assessment of cervical vertebral bone age', *Progress in orthodontics*, 21(1), p. 38.
8. Duraisamy, R. *et al.* (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', *Implant dentistry*, 28(3), pp. 289–295.
9. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(2), pp. 115–121.
10. Gheena, S. and Ezhilarasan, D. (2019) 'Syringic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', *Human & experimental toxicology*, 38(6), pp. 694–702.
11. Gunasekaran, G. and Abilasha, R. (2016) 'TOOTH SENSITIVITY AMONG RESIDENTIAL UNIVERSITY STUDENTS IN CHENNAI', *Asian Journal of Pharmaceutical and Clinical Research*, p. 63. doi: 10.22159/ajpcr.2016.v9s2.13228.

12. Hannah, R., Ramani, P., Sherlin, H. J., *et al.* (2018) 'Awareness about the use, ethics and scope of dental photography among undergraduate dental students dentist behind the lens', *Research Journal of Pharmacy and Technology*, 11(3), pp. 1012–1016.
13. Hannah, R., Ramani, P., Herald. J. Sherlin, *et al.* (2018) 'Awareness about the use, ethics and scope of dental photography among undergraduate dental students dentist behind the lens', *Journal of advanced pharmaceutical technology & research*, 11(3), p. 1012.
14. Harrita, S. and Santhanam, A. (2019) 'Determination of Physical Height Using Clinical Crown Height of Deciduous Teeth', *Indian Journal of Forensic Medicine and Toxicology*, 13(4), pp. 23–27.
15. Hema Shree, K. *et al.* (2019) 'Saliva as a Diagnostic Tool in Oral Squamous Cell Carcinoma - a Systematic Review with Meta Analysis', *Pathology oncology research: POR*, 25(2), pp. 447–453.
16. Hussainy, S. N. *et al.* (2018) 'Clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up', *Journal of conservative dentistry: JCD*, 21(5), pp. 510–515.
17. Janani, K., Palanivelu, A. and Sandhya, R. (2020) 'Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality: an in vivo study', *Brazilian dental science*, 23(1). doi: 10.14295/bds.2020.v23i1.1805.
18. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 19(4), pp. 273–278.
19. Johnson, J. *et al.* (2020) 'Computational identification of MiRNA-7110 from pulmonary arterial hypertension (PAH) ESTs: a new microRNA that links diabetes and PAH', *Hypertension research: official journal of the Japanese Society of Hypertension*, 43(4), pp. 360–362.
20. Jose, J., Ajitha and Subbaiyan, H. (2020) 'Different treatment modalities followed by dental practitioners for Ellis class 2 fracture – A questionnaire-based survey', *The open dentistry journal*, 14(1), pp. 59–65.
21. Kannan, A. and Venugopalan, S. (2018) 'A systematic review on the effect of use of impregnated retraction cords on gingiva', *Journal of advanced pharmaceutical technology & research*, 11(5), p. 2121.

22. Krishnan, R. P. *et al.* (2018) 'Surgical Specimen Handover from Operation Theater to Laboratory: A Survey', *Annals of maxillofacial surgery*, 8(2), pp. 234–238.
23. Kumar, D. and Antony, S. D. P. (2018) 'Calcified canal and negotiation-A review', *Journal of advanced pharmaceutical technology & research*, 11(8), p. 3727.
24. Lin, S. (2018) *The Dental Diet: The Surprising Link between Your Teeth, Real Food, and Life-Changing Natural Health*. Hay House, Inc.
25. Manohar, J. and Abilasha, R. (2019) 'A Study on the Knowledge of Causes and Prevalance of Pigmentation of Gingiva among Dental Students', *Indian Journal of Public Health Research & Development*, 10(8), pp. 95–100.
26. Manohar, M. P. and Sharma, S. (2018) 'A survey of the knowledge, attitude, and awareness about the principal choice of intracanal medicaments among the general dental practitioners and nonendodontic specialists', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 29(6), pp. 716–720.
27. Mathew, M. G. *et al.* (2020) 'Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: Randomized controlled trial', *Clinical oral investigations*, pp. 1–6.
28. Menon, S. *et al.* (2018) 'Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism', *Colloids and surfaces. B, Biointerfaces*, 170, pp. 280–292.
29. Munjal, V. *et al.* (2018) 'Dental caries and its association with present day dietary patterns: a cross-sectional study', *International Journal Of Community Medicine And Public Health*, p. 2138. doi: 10.18203/2394-6040.ijcmph20181737.
30. Musaiger, A. O., Al-Mannai, M. and Abduljawad, E. (2014) 'Association of oral hygiene habits and food intake with the risk of dental caries among undergraduate university women in Saudi Arabia', *International journal of adolescent medicine and health*, 26(4), pp. 585–589.
31. Nandakumar, M. and Nasim, I. (2018) 'Comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion: An optical emission spectrometric analysis', *Journal of conservative dentistry: JCD*, 21(5), pp. 516–520.
32. Nandhini, J. S. T., Babu, K. Y. and Mohanraj, K. G. (2018) 'Size, shape, prominence and localization of gerdy's tubercle in dry human tibial bones', *Journal of advanced pharmaceutical technology & research*, 11(8), p. 3604.
33. Padavala, S. and Sukumaran, G. (2018) 'Molar Incisor Hypomineralization and Its Prevalence', *Contemporary clinical dentistry*, 9(Suppl 2), pp. S246–S250.

34. Palati, S. *et al.* (2019) 'Age Estimation of an Individual Using Olze's Method in Indian Population-A Cross-Sectional Study', *Indian Journal of Forensic Medicine and Toxicology*, 13(3), pp. 121–124.
35. Palati, S. *et al.* (2020) 'Knowledge, Attitude and practice survey on the perspective of oral lesions and dental health in geriatric patients residing in old age homes', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 31(1), pp. 22–25.
36. Pc, J., Marimuthu, T. and Devadoss, P. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*. Available at: <https://europepmc.org/article/med/29624863>.
37. Prasanna, G. E. and Gheena, S. (2016) 'A study of empathy across students from 4 health disciplines among 1st years and Final years', *Research Journal of Pharmacy and Technology*, p. 1472. doi: 10.5958/0974-360x.2016.00286.9.
38. Punitha, V. C. *et al.* (2015) 'Role of dietary habits and diet in caries occurrence and severity among urban adolescent school children', *Journal of pharmacy & bioallied sciences*, 7(Suppl 1), pp. S296–300.
39. Rajakeerthi and Ms, N. (2019) 'Natural Product as the Storage medium for an avulsed tooth – A Systematic Review', *Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi dergisi*, 22(2), pp. 249–256.
40. Rajendran, R. *et al.* (2019) 'Comparative evaluation of remineralizing potential of a paste containing bioactive glass and a topical cream containing casein phosphopeptide-amorphous calcium phosphate: An in vitro study', *Pesquisa brasileira em odontopediatria e clinica integrada*, 19(1), pp. 1–10.
41. Ramadurai, N. *et al.* (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', *Clinical oral investigations*, 23(9), pp. 3543–3550.
42. Ramesh, A. *et al.* (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', *Journal of periodontology*, 89(10), pp. 1241–1248.
43. Ravinthar, K. and Jayalakshmi (2018) 'Recent advancements in laminates and veneers in dentistry', *Journal of advanced pharmaceutical technology & research*, 11(2), p. 785.
44. R, H. *et al.* (2020) 'CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene', *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, pp. 306–312. doi:

10.1016/j.oooo.2020.06.021.

45. Samuel, S. R. (2021) 'Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life?', *International journal of paediatric dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children*, 31(2), pp. 285–286.
46. Sarbeen, J. I., Insira Sarbeen, J. and Gheena, S. (2016) 'Microbial variation in climatic change and its effect on human health', *Research Journal of Pharmacy and Technology*, p. 1777. doi: 10.5958/0974-360x.2016.00359.0.
47. Seccombe, W. (1924) 'Dental Caries in the Light of Present-Day Knowledge of Diet and Nutrition', *The Journal of the American Dental Association (1922)*, pp. 360–365. doi: 10.14219/jada.archive.1924.0206.
48. Sekar, D. *et al.* (2019) 'Methylation-dependent circulating microRNA 510 in preeclampsia patients', *Hypertension research: official journal of the Japanese Society of Hypertension*, 42(10), pp. 1647–1648.
49. Seppan, P. *et al.* (2018) 'Therapeutic potential of *Mucuna pruriens* (Linn.) on ageing induced damage in dorsal nerve of the penis and its implication on erectile function: an experimental study using albino rats', *The aging male: the official journal of the International Society for the Study of the Aging Male*, pp. 1–14.
50. Sharma, P. *et al.* (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', *Chemico-biological interactions*, 309, p. 108720.
51. Sheriff, K. and Santhanam, A. (2018) 'Knowledge and Awareness towards Oral Biopsy among Students of Saveetha Dental College', *Research Journal of Pharmacy and Technology*, 11(2), pp. 543–546.
52. Siddique, R. *et al.* (2019) 'Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem, and tulsi', *Journal of conservative dentistry: JCD*, 22(1), pp. 40–47.
53. Sridharan, G. *et al.* (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(4), pp. 299–306.
54. Teja, K. V., Ramesh, S. and Priya, V. (2018) 'Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study', *Journal of conservative dentistry: JCD*, 21(6), pp. 592–596.
55. Uma, P. K. *et al.* (2020) 'Knowledge about Legal Aspects of Medical Negligence in India among Dentists--A Questionnaire Survey', *Medico Legal Update*, 20(1), pp.

111–115.

56. Verma, S. *et al.* (2016) ‘Indian Dietary Habits in Relation to Dental Caries among 12-15 year old School Children in Bangalore City’, *Cityscape* , 3(1), pp. 44–47.
57. Vijayashree Priyadharsini, J. (2019) ‘In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens’, *Journal of periodontology*, 90(12), pp. 1441–1448.
58. Vijayashree Priyadharsini, J., Smiline Girija, A. S. and Paramasivam, A. (2018) ‘In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species’, *Archives of oral biology*, 94, pp. 93–98.
59. Youssefi, M. A. and Afroughi, S. (2020) ‘Prevalence and Associated Factors of Dental Caries in Primary Schoolchildren: An Iranian Setting’, *International journal of dentistry*, 2020, p. 8731486.

QUESTIONS	OPTIONS	RESPONSES
Gender	Male female	57% 43%
Year of study	3rd year 4th year intern	52.8% 14.6% 32.6%
Which among the following is the most cariogenic sugar?	Lactose Maltose sucrose	27.5% 27.5% 45%
which of the following sugar substitutes reduces chances of dental caries?	Xylitol Aspartame saccharine	45.8% 35% 19.2%
Which of the following foods are anti cariogenic?	Milk Cheese nuts	15.8% 28.3% 55.8%
Which of the following forms of food helps in preventing dental caries and strengthens periodontium?	Firm and fibrous food Liquid food Hard and sticky food	23.3% 46.7% 30%
which among the following deficiencies manifest as oral symptoms?	Vitamin C and B12 deficiency Iron deficiency	20% 35%

	both	45%
with which of the following genetic errors would an individual have no decay?	Hereditary glucose intolerance Hereditary lactose intolerance Hereditary fructose intolerance	20.8% 51.7% 27.5%
Which of the following psychological disorders affect the nutritional status and oral health of an individual?	Bulimia and anorexia Schizophrenia Bipolar and anxiety disorders	32.5% 30% 37.5%
Which of the following elements present in trace amounts in food is strongly cariostatic?	Fluoride Calcium iodine	40.8% 33.3% 25.8%
Do you counsel patients with high caries risk?	Always Sometimes Never	31.7% 50% 18.3%
Do you think diet counselling can help prevent dental caries?	Yes Maybe no	42.5% 40% 17.5%

Table1: Depicts the frequency of responses on Knowledge and awareness of role of diet and dental caries among dental students

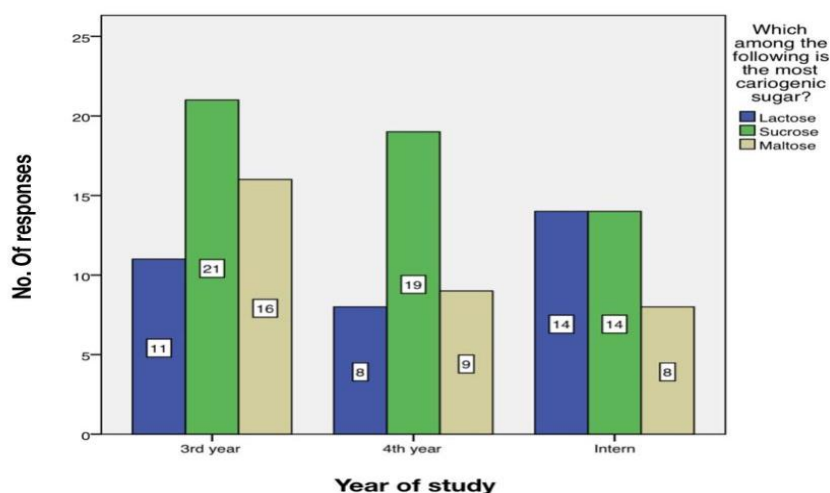


Figure 1: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on cariogenic sugar. X-axis represents different education levels and y-axis represents the number of responses who said lactose (blue), sucrose (green) and maltose (brown). Majority of the third year undergraduate dental students had good knowledge on the most cariogenic sugar (21- green sucrose). However the difference was statistically not significant. Chi square test P value = 0.056 (>0.05 statistically not significant).

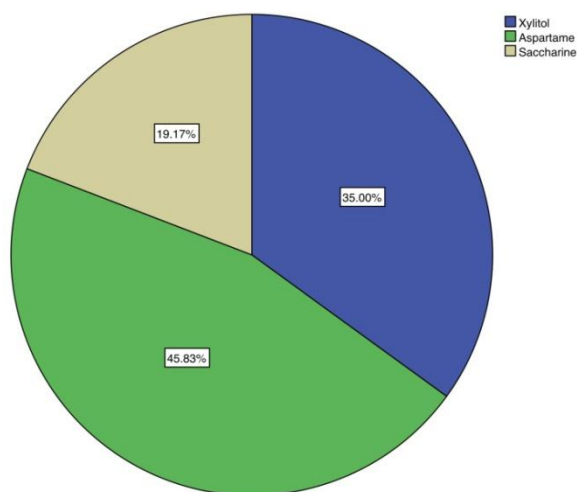


Figure 2 : Pie chart showing the responses to the question about the sugar substitutes which reduces the chances of dental caries. Majority of the respondents responded as aspartame is the sugar substitute which reduces the chances of dental caries (45.83%). Blue colour represents xylitol, green colour represents aspartame and brown colour represents saccharine.

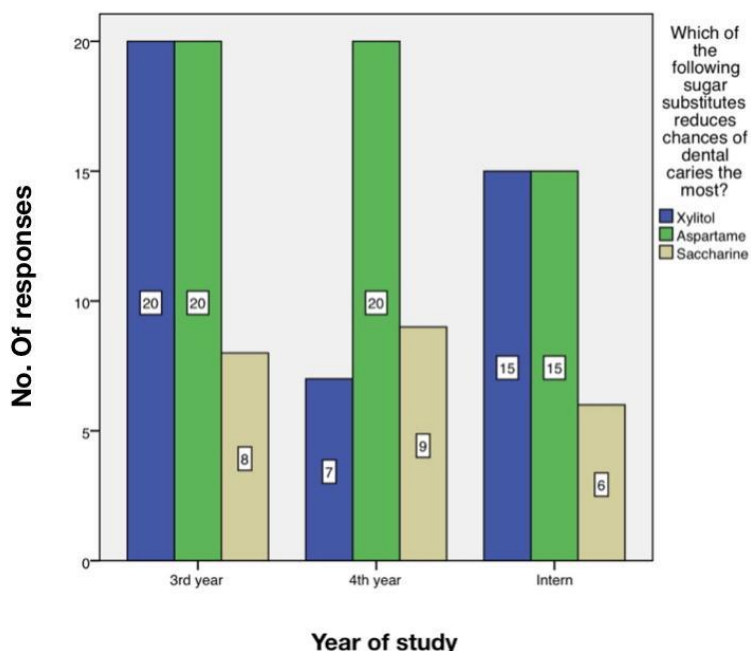


Figure 3: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on sugar substitutes which reduces chances of dental caries. X axis represents different education levels and Y axis represents the number of responses who said xylitol (blue), aspartame (green) and saccharine (brown). Majority of the

fourth year undergraduate dental students have good knowledge on the sugar substitutes which reduces dental caries (20 - blue xylitol) and the difference was statistically significant. Chi square test P value = 0.046 (<0.05 statistically significant).

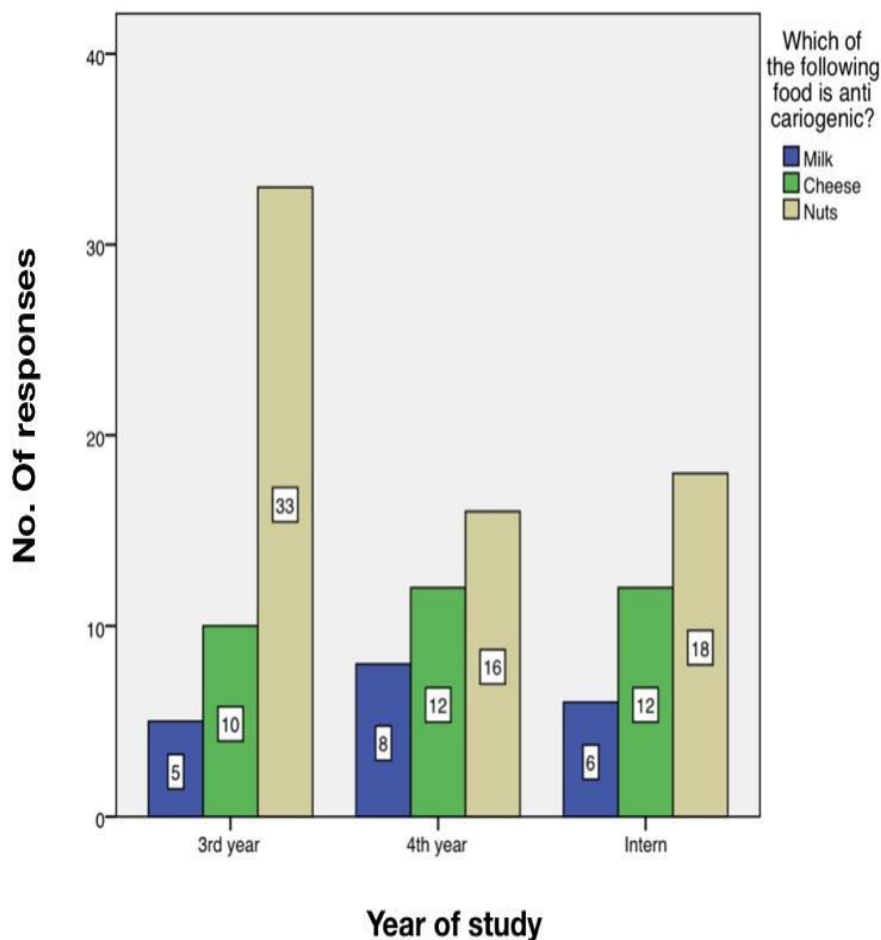


Figure 4: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on food which is anticariogenic. X axis represents different education levels and Y axis represents the number of responses who said milk (blue), cheese (green) and nuts (brown). Majority of the third year undergraduate dental students had good knowledge of anticariogenic food (33 - brown nuts). However the difference was statistically not significant. Chi square test P value = 0.112 (>0.05 statistically not significant).

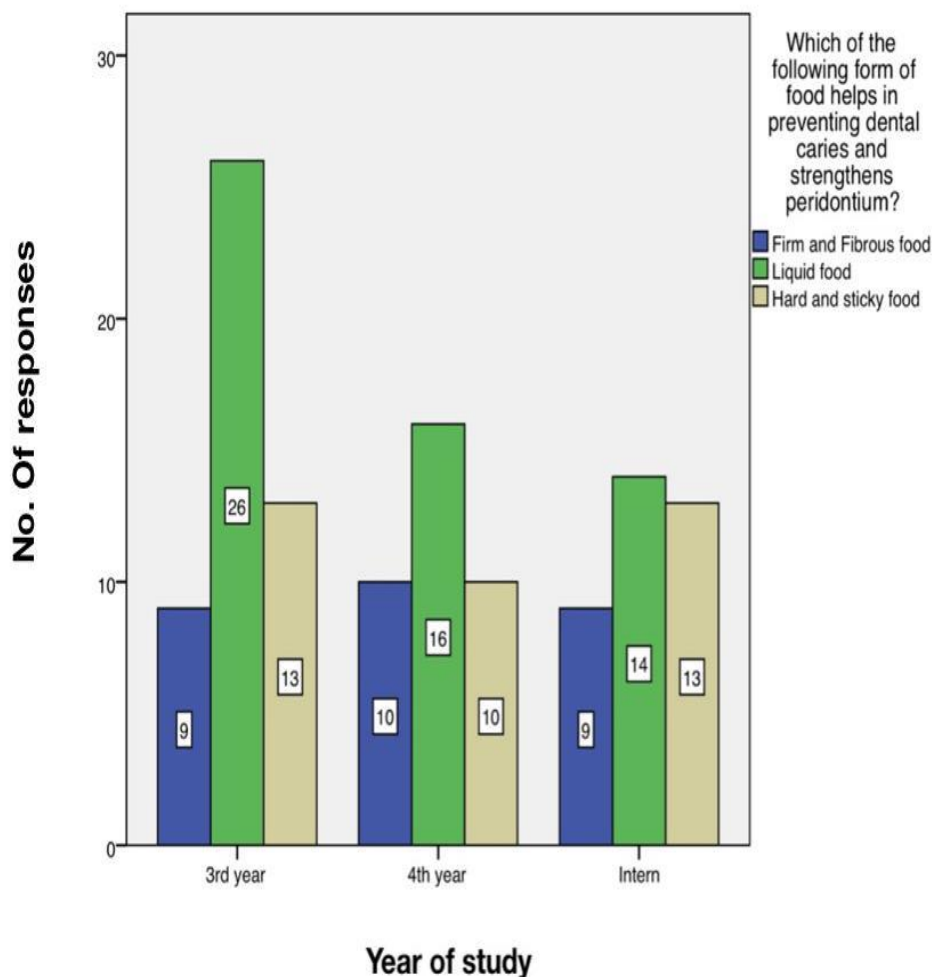


Figure 5: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the form of food which helps in preventing dental caries and strengthens periodontium. X axis represents different education levels and Y axis represents the number of responses who said firm and fibrous food (blue), liquid food (green) and hard and sticky food (brown). Majority of the third year undergraduate dental students had good knowledge on food which helps in preventing dental caries and strengthens periodontium (26 - green liquid food) and the difference was statistically significant. Chi square test P value = 0.032 (<0.05 statistically significant).

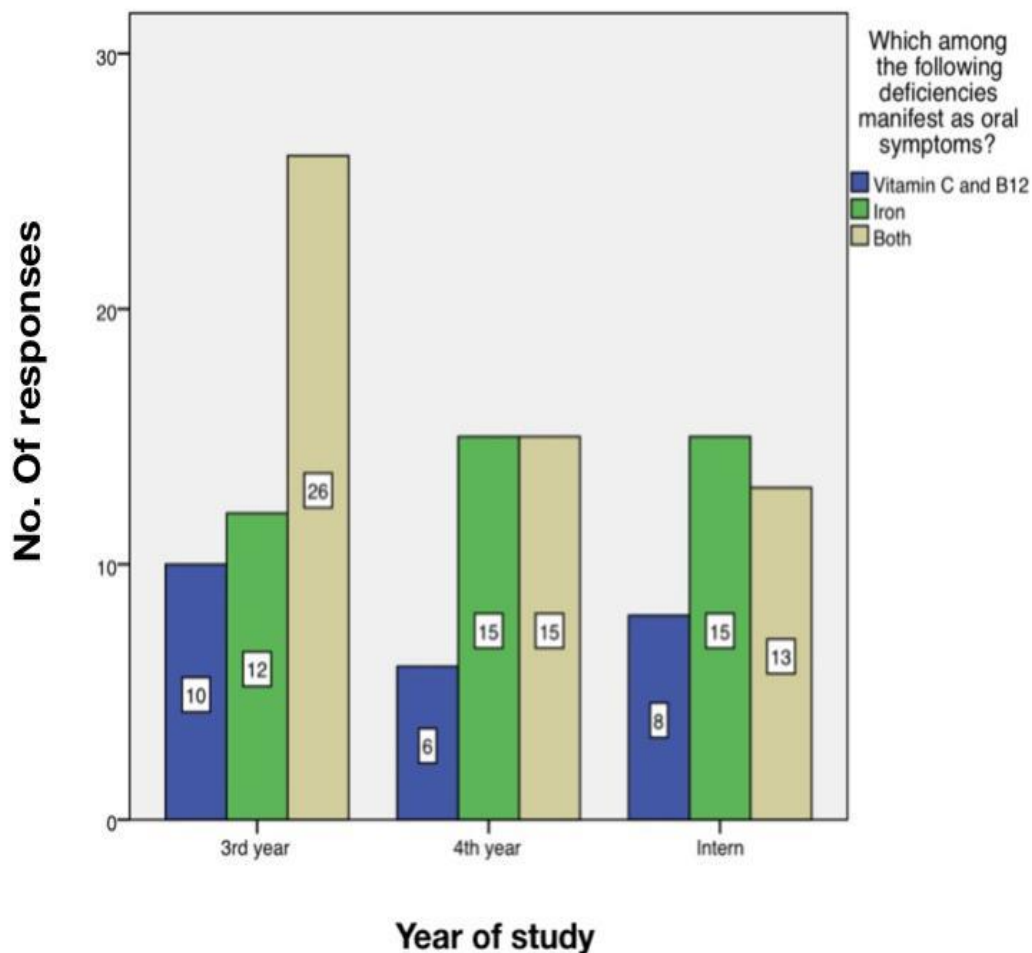


Figure 6: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on deficiency which manifests as oral symptoms. X axis represents different education levels and Y axis represents the number of responses who said vitamin C and B12 deficiency (blue), iron deficiency (green) and both (brown). Majority of the third year undergraduate dental students had good knowledge on deficiency which manifests as oral symptoms (26 - brown both) and the difference was statistically significant. Chi square test P value = 0.012 (<0.05 statistically significant).

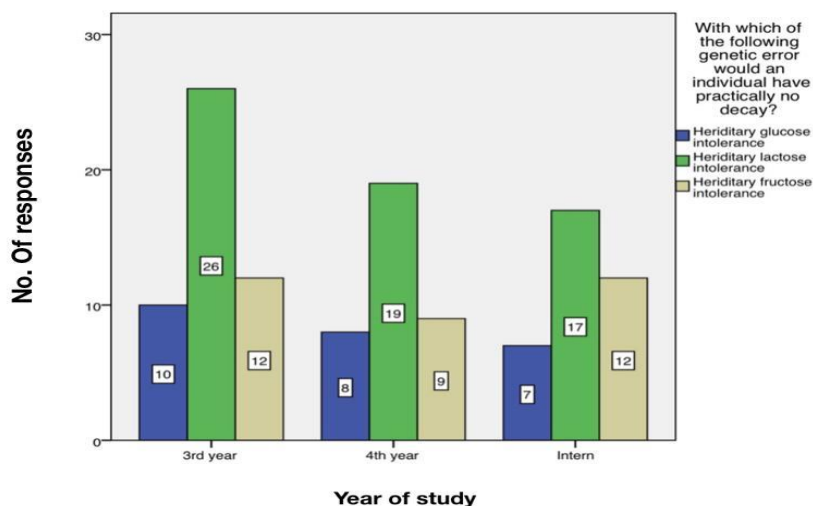


Figure 7: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the genetic error would an individual have no decay. X axis represents different education levels and Y axis represents the number of responses who said hereditary glucose intolerance (blue), hereditary lactose intolerance (green) and hereditary fructose intolerance (brown). Majority of the third year undergraduate dental students had good knowledge on the genetic error an individual would have no decay (hereditary lactose intolerance) (26 - green hereditary lactose intolerance). However the difference was statistically not significant. Chi square test P value = 0.325 (>0.05 statistically not significant).

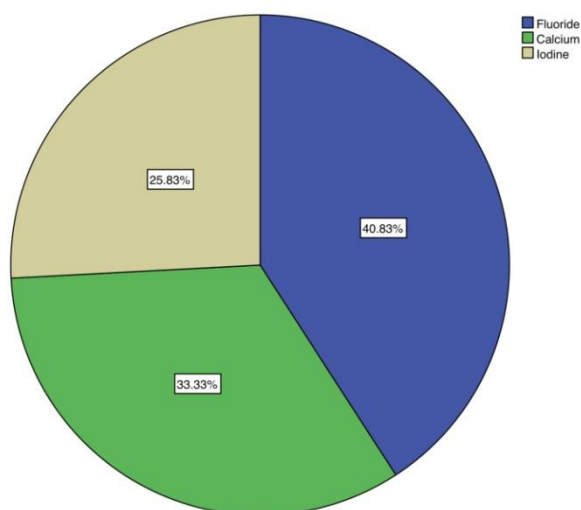


Figure 8: Pie chart showing responses to the question about the trace element found in food which is strongly cariostatic. Majority of the respondents have responded as fluoride (40.83%). Blue colour represents fluoride, green colour represents calcium and brown colour represents iodine.

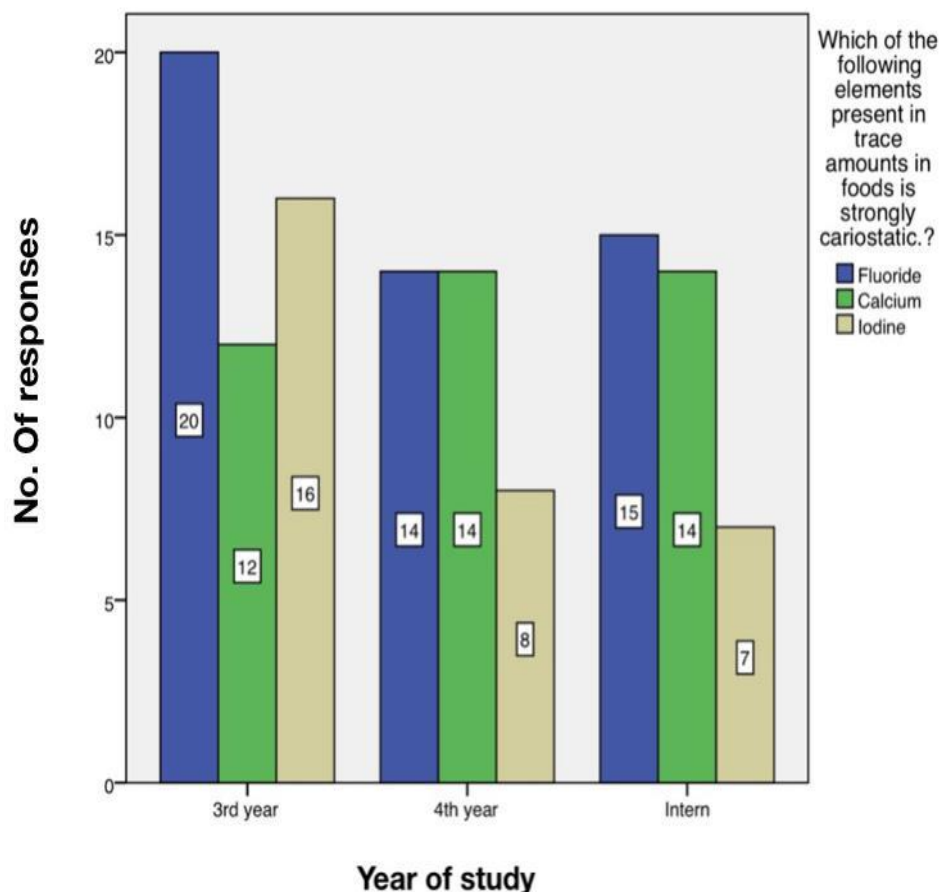


Figure 9: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the trace element found in food is strongly cariostatic. X axis represents different education levels and Y axis represents the number of responses who said fluoride (blue), calcium (green) and iodine (brown). Majority of the third year undergraduate dental students had good knowledge on the trace element found in food is cariostatic. (20 - blue fluoride) and the difference was statistically significant. Chi square test P value = 0.022 (<0.05 statistically significant).

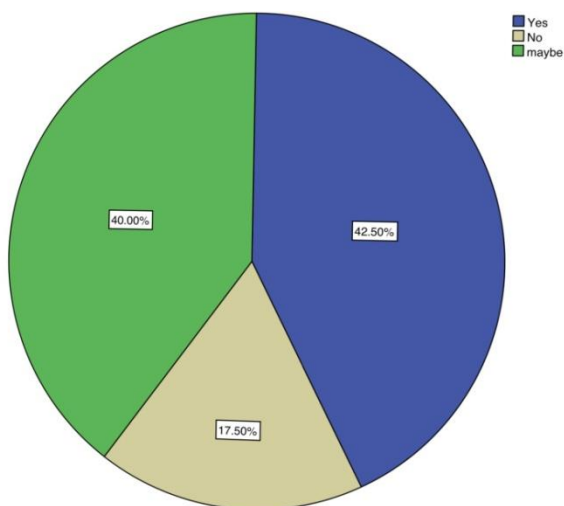


Figure 10 : Pie chart showing responses to the question about role of diet counselling in preventing dental caries. Majority of the respondents have responded as yes (42.50%). Blue colour represents yes, green colour represents may be and brown colour represents no

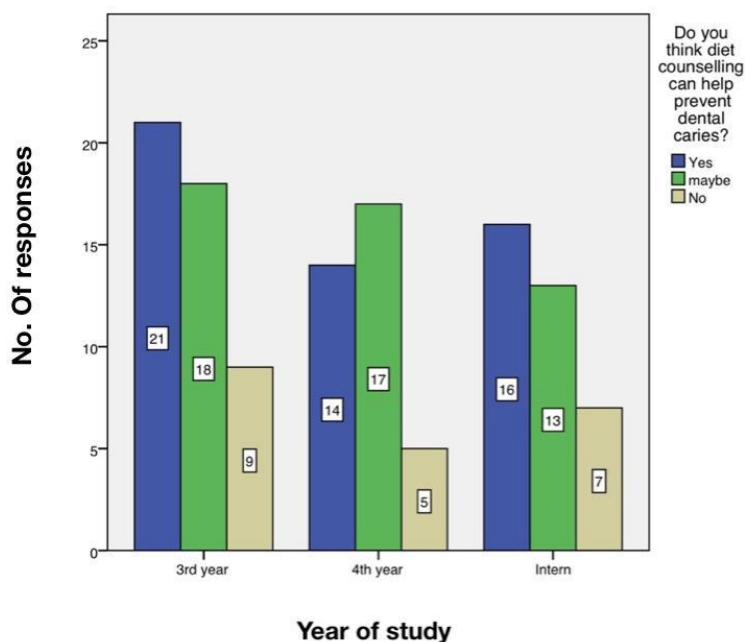


Figure 11: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on whether diet counselling can prevent dental caries. X axis represents different education levels and Y axis represents the number of responses who said yes (blue), may be (green) and no (brown). Majority of the third year undergraduate dental students had good knowledge that diet counselling can prevent dental caries (21 - blue yes). However the difference was statistically not significant. Chi square test P value = 0.456 (>0.05 statistically not significant).

Legends for table

Table1: Depicts the frequency of responses on Knowledge and awareness of role of diet and dental caries among dental students

Legends for graphs

Figure 1 : Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on cariogenic sugar using chi square test.

Figure 2 : Pie chart showing the responses to the question about the sugar substitutes which reduces the chances of dental caries.

Figure 3: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on sugar substitutes which reduces chances of dental caries using chi square test.

Figure 3 : Bar graph showing comparison of education levels to the knowledge on food which is anticariogenic among the undergraduate dental students using chi square test.

Figure 4: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on food which is anticariogenic using chi square test.

Figure 5: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the form of food which helps in preventing dental caries and strengthens periodontium using chi square test.

Figure 6: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on deficiency which manifests as oral symptoms using chi square test.

Figure 7: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the genetic error would an individual have no decay using chi square test.

Figure 8: Pie chart showing responses to the question about the trace element found in food which is strongly cariostatic.

Figure 9: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on the trace element found in food is strongly cariostatic using chi square test.

Figure 10 : Pie chart showing responses to the question about role of diet counselling in preventing dental caries.

Figure 11: Bar graph showing comparison of responses between different educational levels of undergraduate dental students and knowledge on whether diet counselling can prevent dental caries using chi square test.