Journal of Research in Medical and Dental Science
2024, Volume 12, Issue 5, Page No: 01-05

Available Online at: www.jrmds.in
eISSN No. 2347-2367: pISSN No. 2347-2545

Influence of Dietary Types on Dental Caries Patterns and Oral Hygiene Status Among Adult Population At Chengalpattu District – A Correlational Study

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ABSTRACT

Dental caries is one of the major public health problems which affect the quality of life of an individual. Of all the etiologic factors of dental caries, diet is the most crucial etiologic factor which leads to dental caries

Key words: Diet, Dental caries pattern, Oral hygiene status

HOW TO CITE THIS ARTICLE: Soumiya T, Revanth MP, Sruthi AS, et al. Influence of Dietary Types On Dental Caries Patterns And Oral Hygiene Status Among Adult Population At Chengalpattu District – A Correlational Study. J Res Med Dent Sci, 2024; 12(5):01-05.

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Received: 28-Apr-2024, Manuscript No. jrmds-24-126758;
Editor assigned: 01-May -2024, PreQC No. jrmds-24-126758 (PQ);
Reviewed: 15-May -2024, QC No. jrmds-24-126758 (Q);
Revised: 20-May-2024, Manuscript No. jrmds-24-126758 (R);
Published: 27-May-2024

INTRODUCTION

Oral health is the indicator of overall general health. A healthy smile influences psychosocial aspects such as self-esteem, mental health and the ability to socially interact without any discomfort. So, maintaining good oral health not only prevent oral and other infections but also helps us in establishing overall physical and emotional well-being throughout life. Among the oral health problems, dental caries is the most prevalent dental disease concerning to a major dental public health problem. It is an irreversible microbial disease of calcified tissues of teeth [1]. It is seen in most of the population irrespective of age, gender, geographic area, socioeconomic status, diet and oral hygiene habits. Of all the etiologic factors, diet is the most crucial etiologic factor which leads to dental caries [2, 3]. Overall prevalence of dental caries was maximum in mixed dentition – 58%, followed by primary dentition – 54% and 46% in permanent dentition [4]. Earlier diagnosis and appropriate treatment may arrest the progression of dental caries so that it may not lower the quality of life of an individual. Diet is crucial for overall health and development of an individual. Special attention should be given to the role of diet and nutritional status as difference in caries incidence is seen among different groups of people based on diet [5]. Types of diet include i) Vegetarian, and ii) non-vegetarian. There are many variations in vegetarian diet which includes pesco - vegetarian (eats fish, milk and eggs but no red meat nor poultry), lacto-ovo-vegetarian (eats eggs, milk or both but no red meat, fish nor poultry), vegan (eat no red meat, fish, poultry, dairy and eggs). Non – vegetarian diet includes consumption of red meat, poultry, fish, milk and eggs more than once a week. Semi- vegetarian diet is a subtype of non-vegetarian diet which includes red meat, poultry and fish consumed less than once in a week and more than once per month [6]. Apart from dental caries, oral hygiene status is the factor that is taken into study. Oral health is highly dependent on the oral hygiene routine followed by the individual. Poor oral hygiene may lead to plaque deposits that may lead to microbial biofilm formation which further leads to major oral health problem. Chowdhury M R ,et.al. Suggested that vegetarians have significantly better oral hygiene status than compared to non-vegetarians [7]. Various studies were conducted to analyse the

relationship between type of diet and occurrence of dental caries. Rahmatulla M et.al., suggested that there are less caries incidence among vegetarians when compared to non- vegetarians which may be due to cautious intake of food items in vegetarians (refined carbohydrates are restricted from their diet) [8]. Lashkari K P et.al. Suggested that vegetarians have higher risk of dental caries due to consumption more quantities of fruits [9]. Although many studies have been conducted to analyse the relationship between type of diet and dental caries, no other studies revealed the influence of diet on occurrence of patterns of dental caries. The aims of this study are i) to determine the influence of different types of diet on occurrence of patterns of dental caries ii) to assess the influence of oral hygiene status according to (OHI-S index) [10] and iii) to provide a baseline data on the occurrence of above factors.

MATERIALS AND METHODS

Study design and setting

A cross sectional study was conducted among general population over a period of 3 months from August 2023 to October 2023. The study's ethical clearance and approval was given by Institutional Ethical Committee of Karpaga Vinayaga Institute of Dental Sciences.

The sample size was calculated, using G power software version (3.1.9.2). The required Sample size calculated was 192 and it was rounded off to 200. Convenience sampling method was used to choose around 200 participants that made up the study sample. The participants were categorized into vegetarians (100) and non-vegetarians (100) according to the type of diet. All subjects were informed about the aims of the study and informed consent was obtained from the study population. Subjects above 18 years of age and those who are willing to participate were included in the study and with disabilities, oral lesions were excluded.

Data collection

A survey proforma consisting of demographic data and intra oral examination is used. The individuals were examined using mouth mirror, No.23 explorer. Oral examination was done under the guidelines of World Health Organisation (WHO) survey basic methods under natural light [11].

Data Analysis

A Microsoft excel sheet was used for data management. The data was analysed using SPSS Software (version 20). The distribution of study participants was expressed in mean and standard deviation. Unpaired - t test was used for intergroup comparison. The dietary variable was compared and correlated with other variables using Pearson's correlation coefficient 'r'. A p-value <0.05 was considered as statistically significant.

RESULTS

The survey analyzed the influence of diet on dental caries pattern and oral hygiene status. A total of 215 subjects were examined, among them 114 were females (57%) and 86 were males (43%). The mean age of study group was 33.65±11.82. The study population belonged to the socioeconomic status as follows, upper middle class (36.5%), lower middle class (43%), and upper lower class (20.5%). Among the study population, non-vegetarians were 51.2% and 48.8% were vegetarians (Table 1).

(Table 2) shows the mean number of decayed teeth based on diet and it was found that the mean score was higher among non-vegetarian diet (2.18 ±1.63) when compared with vegetarian diet(1.40±1.34) which was stastically significant (p=0.000). The mean decayed score of class 1 and class 2 caries was found to be highest among non-vegetarian diet, when compared with vegetarian diet which was stastically significant for class 1 (0.001) and class 2 (0.031). The mean DMFT score was higher among non-vegetarian diet(2.31±1.73) when compared with vegetarian diet(1.52±1.46) which was statistically significant(0.000). The mean OHI-S score was higher among non-vegetarian diet(1.51±0.65) when compared to vegetarian diet (1.31±0.69) which was statistically significant (p=0.039).

(Table 3) shows that there is a positive correlation that exists between types of diet and other variables such as class 1 and class 2 dental caries, OHI-S status, DMFT score.

Table 1: Distribution of study participants.

VARIABLE	MEAN±SD
Age (in years)	33.65±11.82
Variables	N%
GENDER	
Female	114 (57%)
Male	86 (43%)
SOCIOECONOMIC STATUS	
Upper middle class	73 (36.5%)
Lower middle class	86 (43%)
Upper lower class	41(20.5%)
TYPE OF DIET	
Non-vegetarian	100 (50%)
Vegetarian	100(50%)

Table 2: Comparison of Oral health status (Decay, Pattern of dental caries, DMFT score, OHI-S score) based on diet.

	VEGETARIAN DIET	NON-VEGETARIAN DIET	
	Mean±SD	Mean±SD	P-VALUE
Total number of dental caries	1.40±1.34	2.18±1.63	0.000*
Pattern of dental caries	Mean±SD	Mean±SD	P-VALUE
Class 1	1.18 ±1.0	1.78±1.45	0.001*
Class2	0.21±0.534	0.81±0.646	0.031*
Class 3	0.02±0.195	0.09±0.5	0.169
Class 4	0	0	0
Class 5	0	0	0
Class 6	0	0	0
Dmft	1.52±1.46	2.31±1.73	0.000*
Ohi-s	1.31±0.69	1.51±0.65	0.039*

-*p value <0.05 implies statistical significance

Table 3: Correlation of types of diet with other variables.

	VARIABLES	R	P VALUE
DIET	Class 1	0.819*	0.001
	Class 2	0.628*	0.031
	OHI-S	0.751*	0.039
	DMFT	0.652*	0

* Correlation is significant – strong positive correlation

DISCUSSION

As oral health is an integral part of general health, any functional changes may affect the overall quality of life of an individual. Oral diseases are major public health problem. They have an impact on people's quality of life [12, 13]. Since dental caries is the most prevalent, the current study was conducted to analyze the influence of diet on various factors such as dental caries and oral hygiene status. The results showed there is significant association between diet and dental caries. The mean score of decayed teeth based on diet was found to be higher among non-vegetarian diet when compared with vegetarian diet which was stastically significant (p=0.000). The mean score of patterns of dental caries particularly class 1 and classes 2 were higher in non-vegetarian diet when compared to vegetarian diet.

Non–vegetarians have significantly high level of dental caries because they eat meats that have more adherences to the tooth surface. People who have deep pit and fissures are prone to adherence of meat particles on occlusal surface (reason for class 1 dental caries) [14].

They may also be stuck interdentally for a long time and are prone to cariogenic bacteria leading to cavitation (class 2 dental caries). Fruits and vegetables contain starch whose digestion initiates in oral cavity by the action of salivary amylase [15]. Proteins which are complex molecules whose digestion initiates mostly in the stomach by action of hydrochloric acid, pepsin and proteases [16]. Those food

items which stuck in for a longer time eventually leads to plaque build-up and biofilm formation and cariogenic bacteria acts upon the remaining deposits and leads to formation of dental caries. The current study revealed that there is a positive correlation that exists between types of diet and other variables such as class 1 and class 2 dental caries, OHI-S status, DMFT score. Showed that prevalence of dental was higher in non-vegetarian group compared to vegetarian group. This may be associated with cautious food intake by vegetarian group. (Refined carbohydrates are restricted from their diet).

High number of dental caries was observed among vegetarian population compared to non-vegetarian. This could be due to consumption of more protein in comparison to sugar by non-vegetarians [17,18].The mean DMFT score was higher among non-vegetarian diet when compared with vegetarian diet. Vegetarian diet has significantly lower DMFT score and higher risk for dental erosion when compared with non-vegetarian diet. This may be due to consumption of more fruits which contains acids that lowers the pH of saliva and may lead to erosion [19].

Poor oral hygiene results in plaque buildup which results in biofilm formation, is also an important factor which leads to demineralization and formation of dental caries. The mean OHI-S score was higher among non-vegetarian diet when compared to vegetarian diet. Raw vegans have better oral hygiene and simplified oral hygiene index was also significantly lower and it is in accordance with the current study. This may be due to their better oral care and lifestyle [20]. Vegetarians have comparatively better oral hygiene; this may be due to easy oral clearance of vegetarian food in the oral cavity and hence significantly less dental caries and better oral hygiene. The limitations of the current study include smaller sample size. Further, frequency of meal intake was not considered, oral hygiene practice and utilization of dental care was not collected from study participants. Many longitudinal studies with larger sample size have to be conducted in order to get concrete evidence on the relationship between types of diet and different pattern of dental caries.

CONCLUSION

The current study shows statistically significant association between the number of decayed teeth and types of diet. It was found that the mean score was higher among non-vegetarian diet when compared with vegetarian diet. The mean decayed score of class 1 and class 2 caries was found to be highest among non-vegetarian diet, when compared with vegetarian diet which was stastically significant. The mean DMFT score and OHI-S status were higher among non-vegetarian diet when compared with vegetarian diet which was statistically significant. Dental health conditions are associated with overall quality of life of an individual. Individual counselling on healthy eating habits and oral hygiene practices must be given to people who are at high caries risk.

REFERENCES

1. Munjal V, Talwar PS, Singh J, et al. Dental caries and its association with present day dietary patterns: a cross-sectional study. Int J Community Med Public Health 2018: 2138.
2. Abbass MM, Mahmoud SA, El Moshy S, et al. The prevalence of dental caries among Egyptian children and adolescences and its association with age, socioeconomic status, dietary habits and other risk factors. A cross-sectional study. 2019; 8.
3. Guo A, Wide U, Arvidsson L, et al. Dietary intake and meal patterns among young adults with high caries activity: a cross-sectional study. BMC Oral Health 2022; 22:190.
4. Pandey P, Nandkeoliar T, Tikku AP, et al. Prevalence of dental caries in the Indian population: A systematic review and meta-analysis. JISPCD 2021; 11:256-65.
5. Punitha VC, Amudhan A, Sivaprakasam P, et al. Role of dietary habits and diet in caries occurrence and severity among urban adolescent school children. J pharm bioallied sci. 2015; 7(1):S296-300.
6. Le LT, Sabaté J. Beyond meatless, the health effects of vegan diets: findings from the Adventist cohorts. Nutri. 2014; 6:2131-47.
7. Chowdhury MR, Rajaram SS, Kumar U, et al. Comparative evaluation of periodontal health in vegetarians and nonvegetarians–a cross-sectional study. Int. J. Nutr. Pharmacol. Neurol. Dis 2022; 12:153-6.
8. Rahmatulla M, Guile EE. Relationship between dental caries and vegetarian and non-vegetarian diets. Community Dent Oral Epidemiol 1990; 18.
9. Lashkari KP, Raghunath R. Assessment of the influence of vegetarian and nonvegetarian diet on the occurrence of dental caries in Sullia, Karnataka, India. Int J Oral Care Res 2016; 4:247-50.
10. Greene JG, Vermillion JR. The simplified oral hygiene index. J Am Dent Assoc. 1964; 68:7-13.
11. World Health Organization. Oral health surveys: basic methods. World Health Organization. 2013.

12. Spanemberg JC, Cardoso JA, Slob EM, et al. Quality of life related to oral health and its impact in adults. J Stomatol Oral Maxillofac Surg. 2019; 120:234-9.

13. Feldens CA, Kramer PF, Vargas-Ferreira F. The role of diet and oral hygiene in dental caries. Pediatric restorative dentistry. 2019:31-55.

14. Altaf G, Garg S, Saraf BG, et al. Clinical study of pit and fissure morphology and its relationship with caries prevalence in young permanent first molars. JSAAPD 2019; 2:57.

15. Brownlee IA, Gill S, Wilcox MD, et al. Starch digestion in the upper gastrointestinal tract of humans. Starch-Stärke. 2018; 70(9-10):1700111.

16. Lee SY, Kang JH, Jeong JW, et al. Methods for improving meat protein digestibility in older adults. JAST 2023; 65:32.

17. Khan AA, Jain SK, Shrivastav A. Prevalence of dental caries among the population of Gwalior (India) in relation of different associated factors. Eur J Dent. 2008; 2:081-5.

18. Bhardwaj VK, Negi N, Fotedar S, et al. Does nature of diet consumed has an association with the prevalence of dental caries?. Eur J Dent. 2013; 2:332-.

19. Smits KP, Listl S, Jevdjevic M. Vegetarian diet and its possible influence on dental health: A systematic literature review. Community Dent Oral Epidemiol. 2020; 48:7-13.

20. Atarbashi-Moghadam F, Moallemi-Pour S, Atarbashi-Moghadam S, et al. Effects of raw vegan diet on periodontal and dental parameters. Tzu Chi Med J. 2020; 32:357-61.