

# Systematic evaluation on perception of dental nutritional knowledge among dental residents in Pune- A questionnaire study

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## Systematic evaluation on perception of dental nutritional knowledge among dental residents in Pune- A questionnaire study

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### ABSTRACT

**Background:** A healthy diet and recommended nutrition plays an effective and empirical role in ascertaining the comprehensive growth and development in all aspects with ultimate and viable importance in maintaining the oral health of the growing child. Perhaps this realization and acquirement of concept of nutrition has to be inculcated in all the dental professional graduates during the beginning of their dental curriculum. The importance of acquiring upgraded and evidence based acquaintances with regards to dental nutritional knowledge gains to remain an utmost priority in all aspects.

**Methods:** A questionnaire based study was conducted in the department to assess dental nutritional knowledge among dental interns during their subsequent visit to dental clinics. Hundred registered dental interns participated in this study. The dental residents were distributed with preevaluated and testified samples of questions of fifteen in number with each bearing choices of multitudinous in nature. Following the responses obtained in the provided set of questions they were methodically scrutinized and examined to obtain the results.

**Results:** The obtained figures definitely suggests that a majority of dental residents were aware of the basic knowledge about nourishment and diet, however their resultant values suggest that the dental interns required more advancements and were willing to uptake more educational awareness programs on importance of diet and nutrition and its influence on dental health.

**Conclusion:** The dental graduates have to be provided with more impactful programs which would provide With awareness on dental nutritional knowledge

**Key Words:** Knowledge, Awareness, Oral Health, Dental Residents

## **INTRODUCTION**

In today's global scenario, dental diseases are estimated to contribute to an enormous percentage of rapidly progressing pandemic among the general population. Individual's dental health status is regulated by the active involvement of legions of causative elements which guides its impact on the general health and well being of the individual. Unattended dental scenarios will ultimately result in hampering the individual's routine activities thereby leading to an unprecedented affect on the person's psychological, physical and interactive social living. However out of the defined environmental factors diet instigates to have an impeded influence on the progressive nature of dental diseases. The estimated surveys published by the <sup>10</sup> World Health Organization undeniably furnishes the fact that nearly about 70- 80% of vast majority of pertaining dental diseases is solely accredited to the prevailing incorrect dietary and lifestyle practices. Irrespective of age and gender an adequate diet is defined to cavort the critical health of population. Nutrition is defined as the planned and analytical measurement of nourishing supplies to the healthy viable being and the mechanisms by which these nourishments are involved in enrichment of body's vitality and healthy functional mechanism. An adequate and well balanced diet is considered to be highly unavoidable for robust and thriving life. The unrequited definition that diet rich in nutritious and fibrous foods have considerable impact on reduction of dental caries and other dental diseases have been proven through a vast majority of experimental observations.

The need of the hour being the fact that all health professionals including dental practitioners ultimately should be able to devise and provide factorial checks on the importance of modulating towards healthy diet and identification of probable risks involved in non-monitored nourishment intake. In order to carry out these devised scenario it is highly essential that dental professionals have sufficient knowledge about nutrition in their extremes. It relies with the popular saying of

mouth explicit to be the body's mirror as dental health and nutrition have a causal interdependent relationship. It is henceforth determined that a peerless dietary nourishments are required for ideal growth, calcification and development of both primary and permanent dentition. Hence this establishes the fact that lack of proper awareness of balanced nutrition or inadequate nutrition will obviously have an unidentified effects on oral structures thereby leading to increased incidence of dental caries, periodontal lesions and other oral conditions.

Ideally the dental professionals has the unique opportunity of examining healthy oral tissues during their routine dental checkup which is usually a contrary attitude seen among other health care providers who generally attend patients once inflicted by the onset of symptoms of any particular illness. However it is highly recommended that obtaining a highly ordained diet chart and nourishment status of the patient will henceforth enable the dental professional to get a bird's eye view of the existing eating pattern of the individual. This diet history will also detail the quantity of nutritious food required for that individual which would be beneficial in identifying the mandatory consumables to prevent the advancement and obviation of any particularly manifested oral diseases. Hence in general regards dental professionals take into consideration this nutrition factor and claim to provide advocative suggestions of including highly fibrous, proteinaceous and less sweet and sticky food varieties for obtaining and maintaining a healthy oral environment. However considering the nutrition aspect it is mandatory that all dental students during their course of study in their professional curriculum should be trained effectively on <sup>1</sup> the importance of adequate diet and nutrition in determining the overall well being of the patients. The number of experimental and inferential studies are comparatively less in this aspect the present clinical study will help us in assessing the dental nutrition knowledge among the newly qualified dental interns in Pune.

## **MATERIAL AND METHODS**

### **ETHICAL CONSIDERATION**

The Ethical consideration and corresponding approval for the study titled “Systematic evaluation on perception of dental nutritional knowledge among dental residents in Pune- A questionnaire study”<sup>2</sup> was procured from the Institutional Scientific Review Board accordingly.

### **QUESTIONNAIRE**

The systematic evaluation and estimation of dental nutritional knowledge of dental residents were accomplished with the utilization of preset and pre-established the done using a predetermined questionnaire form. This was obtained from the instated questionnaire by Labban et al which was obtained and then reformed as per the requirements and standardization of our study. The illustrated placate of the preset questionnaire was substantially corroborated by opulent assemblage of adepts from the discipline and coincidental moderations were done. The finalized set of evaluated questions were then exerted into a identified trial run of twenty dental residents in number to confirm the rationality and authenticity of the same. The finalized version of the accepted questionnaire instituted the inclusion of sequentially arranged fifteen prospective questions which included set of apprehended questions determining (a) Knowledge (b)attitude and (c)awareness of the dental residents on the basis of the predetermined topic of interest.

### **STUDY POPULATION**

The study population included all dental residents registered in<sup>2</sup> Dr. DY Patil Vidyapeeth there by totalling the sample size to 100 in number. A well elaborated contributor guidance and documentation folio was presumed to all the included dental residents in accordance with the required authorization form with a presumable statement of disposition of the selected dental

residents to volunteer in the concerned study scenario. The estimated and determined allocation of the scheduled time for effective execution of the study was of six months duration.

### **DATA COLLECTION**

The preset established set of fifteen questions were cohesively disseminated within the inclusive set of selected of dental residents with competent explanation of the diverse facets and protocols for transmitting this observational analysis. The approximated time of response availed by the inclusive dental residents for expressing their ultimate feedback was determined to be around an acceptable duration of 20 minutes approximately. The received replies were then sequentially systematized to Microsoft Excel for further interpretation and exploration of he same.

### **STATISTICAL ANALYSIS**

The population criterion and foresaid sampling required for this observational study was estimated with census method of sampling and thereby reaching a total of 100 inclusive in number for the same. The resultant specified feedback obtained by the inclusive dental residents were strategically arranged into Microsoft Excel sheet and substantially estimated for subsequent numerical scanning and evaluation. The numerical analysis and evaluation of the obtained data was then evaluated accordingly utilizing SPSS software version 26(version 26, IBM Corporation, Texas, USA). Chi-square evaluation tests and descriptive statistics were employed to strategically compare and evaluate the collected data from the inclusive category of dental residents. A indomitable P value of <0.001 was determined to be significant with regards to the present study scenario.

## RESULTS

Aggregate responses to the questions

<u>Questions</u>	<u>Responses</u>		<u>Chi-Square</u>	<u>P-value</u>
1. Do you think that maintaining adequate diet and nutrition is essential for good oral health?	9 a. Yes b. No c. Don't Know	100%		0.001
2. Do you advise your patients regarding the importance of diet and nutrition for maintaining good oral health?	a. Yes b. No c. Not Always	92% 8%	13.601a	0.001
3. According to you which among the following is the most cariogenic sugar?	a. Sucrose b. Lactose c. Maltose	96% 4%	6.517a	0.038
4. Which among the following sugar substitutes reduces incidence of dental caries predominantly?	a. Xylitol b. Aspartame c. Saccharine	95% 5%	8.232a	0.016
5. According to you which among the following is anticariogenic?	a. Milk b. Cheese c. Nuts	66% 34%	80.575a	<0.001
6. Which among the following food prevents dental caries occurrence?	a. Fibrous food b. Sticky food c. Liquid food	91% 9%	15.469a	<0.001
7. Which among the following elements is highly cariostatic?	a. Fluoride b. Calcium c. Iodine	72% 28%	60.826a	<0.001



8. Which among the following provides maximum calories irrespective of being same amount by weight?	a. Sugar b. Fiber c. Fat	91% 9%	54.955a	<0.001
9. <sup>1</sup> Which among of the following deficiencies manifest as oral symptoms?	a. Vitamin C and B12 deficiency b. Iron deficiency c. Both	79% 21%	41.577a	<0.001
10. <sup>1</sup> With which of the following genetic error would an individual have practically no tooth decay?	a. Hereditary glucose intolerance b. Hereditary lactose intolerance c. Hereditary fructose intolerance	32% 68%	38.503a	<0.001
11. <sup>1</sup> Which of the following psychological disorders affect nutritional and oral health of an individual?	a. Bulimia b. Schizophrenia c. Bipolar and anxiety disorders	52% 48%	88.636a	<0.001
12. How many servings of fruits and vegetables should you include in a day's diet?	a. 3 b. 4 c. 5 and more	49% 52%	78.610a	<0.001
13. Do you feel that diet and nutrition was given sufficient importance during your dental education curriculum?	a. YES b. NO c. Can't Say	60% 40%	96.528a	<0.001
14. Are you aware of My Plate categories?	a. YES b. NO	83%	32.036a	<0.001

		17%		
15. Do you think more awareness programmes on importance of diet and nutrition on oral health have to be organized on timely manner?	a. YES b. NO	84% 16%	29.792a	<0.001

The table displays aggregation of the required responses to the systematically displayed questions and the resultant correlation with the awareness and knowledge among dental interns regarding dental nutrition. It is evidently proven that all the dental interns (100%) confirmed that maintaining a highly sustainable diet and nutrition is essential more stabilizing a good and efficient dental health (P-0.001). A vast majority of dental interns also confirmed the facts that they enforce the need of diet and nutrition to among their patients who visit them for treatment and follow up during their course of time (P-0.001). Out of the registered dental interns they displayed a preponderance of (96%) confirmed to the correct answer of sucrose being highly cariogenic among the following options (P-0.38). About 95% of the dental interns identified xylitol as the ideal sugar substitute which has a major role in reduction of dental caries (P-0.016). Milk was chosen as the required option in contrast to cheese by 66% of dental interns as the most anticariogenic food item available whereas only 34% of them chose cheese as their ideal food alternative. Nearly 91% of the posted dental interns were definitive about the fact that fibrous food has to be included in daily diet as it prevents caries occurrence and strengthens periodontium (P<0.001). Nearly 76% of dental interns solemnly confirmed that the element Fluoride exhibits an inherently evident highly demandable cariostatic activity when compared to other available elements (P<0.001). The dental interns totaling to nearly 91% was determined with the fact that intake of sugar contributed more amount of calories when compared to fats and fibers (P<0.001). Considering their undergraduate

curriculum which they have obtained about a vast majority of 91.7% firmly confined to the fact that their undergraduate education provided them with sufficient knowledge regarding the importance of diet in maintaining ideal dental health( $P<0.001$ )

About 79% dental interns believed the established fact that Vitamin C and B12 deficiency have well demarcated oral manifestations which can be predominantly identified( $P<0.001$ ). However it is also determined that only 32% of the dental interns were conformably aware that Hereditary fructose intolerance did not contribute to any incidence of dental caries. When the dental interns were instructed to identify the psychological diseases which had incoherent oral manifestations only 52% of dental interns defined that Bulimia had considerable effects on the individuals general nutritional and oral health status( $P<0.001$ ). Considering the daily fruit intake 49% of participating dental interns believed the fact that daily about 4 servings of fruits have to be included for a healthy diet. Only 83% dental interns confirmed that they were aware of My Plate system which is one of the most rapidly and fast paced diet table that is being adapted for practicing healthy eating among population( $P<0.001$ ). Nearly out of the participating dental interns 84% defined the particular need for more awareness program which would highlight <sup>1</sup> the importance of diet and its correlation to oral health both among the health care professionals and the general population( $P<0.001$ ).

## **DISCUSSION**

Inadequate nourishment has an undesirable governance on the individual's immune system thereby exposing them to numerous dental diseases. Inclusion of diet and nutrition in to the dental curriculum mainly is to reciprocate the fact of appropriate care, forestalling illness and its treatment conductance. It is therefore mandatory criterion that absolute tutoring with respect to diet and nutrition awareness have to be in cultivated among the dental students in the course of their academic curriculum and practices. The present questionnaire based study thus states the dental

nutritional knowledge among the dental interns which would help in creating a structural avenue in upcoming years aiding in teaching and training undergraduates.

Studies conducted by Zero, D. T et al explains the finding that sucrose is proven to possess maximum <sup>4</sup> cariogenic potential when in comparison to lactose and fructose. Cury J.A et al also supported this finding with the addition to the existing fact that the cariogenic nature <sup>4</sup> of dental plaque formed in presence of sucrose is more potent than any other secondary sugars. In addition to this Nobre et al stated that incidence of dental caries is found to rise considerably in primary dentition in the presence of highly potent cariogenic sucrose. <sup>1</sup> Sivakumar et al. in his study conducted among dental interns they stated that 64% of them considered sucrose as the sugar with most potent cariogenic potential. These findings correlates with our present study in which 96% of dental interns confirmed sucrose to be highly cariogenic in nature.

Xylitol has been indicated to rapidly promote progressive process of mineralization when consumed in a systematically followed diet. Xylitol also possess the unique property of being the unique sugar which is practically non fermentable by bacteria present in the oral cavity. <sup>1</sup> Mohammad Z et al in his study conducted among dental practitioners regarding the cariogenic effect of xylitol established his findings that 63.6% of dental practitioners believed that xylitol is the most efficient sugar substitute which reduces <sup>6</sup> the incidence of dental caries. Our study also approves the fact that 95% of dental interns coincided that xylitol reduces dental caries to a greater extent.

Telgi et al in his studies have profoundly stated that cheese is one of the most highly acceptable dairy product which has inbuilt capacity of being anticariogenic in nature. Salivary secretion is found to have a spike on consumption of cheese in our diet. Rugg-Gunn <sup>2</sup> et al. in his study has explained the fact that inspite of the beneficial effects of cheese only 15.4% of dental students

believed that it possessed anticariogenic effect. However our study is a strict contrast to this findings which estimated that the dental that 66% of dental interns substantiated anticariogenic potential of cheese rather than commonly available milk.

About 91% of participating interns were aware that high fiber foods promoted increased mineralization and decreased incidence <sup>8</sup> of dental caries occurrence. Chalmuri et al in his study determined that post graduate students confirmed that vegetables and fibrous foods decreased the incidence of occurrence of dental caries which corresponds to similar findings to that in our study. Alcântara PC et al. in a study conducted by him and colleagues elaborated with evidence based scenario that Fluoride prevents dental decay by enhancing enamel resistance and increasing remineralization which also entrusts the findings corresponding to our study stating that 72% of dental interns considered Fluoride as the most cariostatic element in comparison to any other available elements. As in general terms sugar is considered as the major criminal in affecting the general health status of the individual, several studies also entail the fact that sugar is upheld with an increased definition of calories when compared to other consumable products of fibers and fats. Moynihan P et al. had given a detailed and conclusive explanation in the review stating the intake of free sugars has to be reduced in both children and adults as it totals to an increased disease prevalence and hampers health however 91% of dental interns also estimated similar findings that sugar continues to remain as undeniable threat in progression of dental caries and other diseases. Nourishment plays a highly significant criterion in stabilizing the coherence of dental tissues which <sup>5</sup> plays a major role in maintaining the integrity of oral tissues, hence any reduced nourishment or improper nutrition can therefore result in onset of numerous lesions and subsidiary other oral lesions. Nireeksha et al in their review have well orderly detailed that vitamin deficiencies especially Vitamin C, Vitamin B12 and Vitamin D can result in significant oral manifestation

which corresponds to findings in our study which states that 79% of dental interns reviewed the response that vitamins definitely causes undesirable oral manifestations which often go unnoticed when not looked into detail in absolute manner.

Newbrun et al in his study has clearly that subjects with Hereditary fructose intolerance have a reduction of dental caries of more than 10% when compared to patients without the hereditary condition. However only 32% of dental interns confirmed to the findings that HFI does not cause any significance dental caries. Kisely et al had studied and arrived at conclusions stating that patients with severe bulimia and anorexic conditions display definitive symptoms of these nutritional and dietary deficiencies evidently in the oral tissues. 52% of dental interns were able to identify that these have significant influence on surrounding oral structures which clarifies the need of correlating and updating the knowledge on diet and nutrition among dental interns. Shreeja et al in her questionnaire based survey had defined that regular consumption of regular 4-5 servings of fruits and vegetables gradually had a positive impact of general health along with oral tissue integrity which also corresponds to the findings of present study stating that nearly 49% of dental interns corresponds with the findings of Shreeja et al.

However it is well established fact that the need for more awareness and practicality in detailing the importance of diet and addition of nutrition is considered to be highly importance to impart more knowledge on the importance of dental nutritional knowledge among dental interns. This ideology is consistent with the findings of our present study which describes that only nearly 83% of dental interns were consistently aware of My Plate system and that a vast majority were opinionated that there existed a considerable need for creating awareness and imparting higher educational standards on basis of dental nutritional knowledge among undergraduates and dental interns which unreliably corresponds to findings processed by Sivakumar et al in which he

explained that nutrition was considered as a vital component which has to be further incultivated among dental interns at an utmost level of significance.

## **CONCLUSION**

The set of 15 questions utilized in the current observational scenario undoubtedly and explicitly establishes the factuality on the aspect that the topic of concern in this study on dental nutritional knowledge has to be coherently considered and inculcated in the dental residents. Our findings enforces the fact that all dental graduates have basic knowledge regarding nutrition which definitely has to be engrossed so that they get a bird's eye view with respect to the need of its importance on oral health. However this has also signified the factuality of containment of more inclusive awareness and educational emporiums which would cauterize the dental graduates on the undeniable momentousness and need of inclusion of dental nutritional knowledge in the existing modules of professional education.

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