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Original Article

Dentistry Section

Assessment of Dental Nutrition Knowledge among Nutrition/ Dietetics Students

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ABSTRACT

Introduction: Diet and nutrition plays an important role in signifying the health of an individual. Oral health is the most important aspect of the body when it comes to food intake and its health benefits. It is important for the nutrition/dietetics students to be aware of the health modalities related to oral aspect.

Aim: The aim of the present study was to assess knowledge towards the effect of diet and nutrition on oral health among nutrition/dietetics students of Udaipur city, Rajasthan, India.

Materials and Methods: A descriptive cross-sectional study was conducted among all the nutrition and dietetics students of Udaipur city. A self-administered, pretested 14 item questionnaire was given to 180 students to assess their knowledge about dietary factors related to caries, anti-cariogenic foods, frequency and duration of sugar intake etc. One-way analysis of variance and independent sample t-test were utilized for statistical analysis. Confidence level and level of significance were set at 95% and 5%, respectively.

Results: The mean score for knowledge was 28.92±1.72. Mean knowledge scores for III, II and I year students were 29.91±1.94, 29.56±1.27 and 27.30±1.66 respectively. When post-hoc Bonferroni test was applied, mean knowledge score was found to be at a higher end among III year as compared to I year (p=0.03) students.

Conclusion: This study highlights about low dental nutrition knowledge among nutrition/dietetics students. Health professionals should have more information outside their immediate fields. Inter-professional team members should work in collaboration with each other to improve patient outcomes.

Keywords: Caries, Cross-sectional study, Diet

INTRODUCTION

The quality of diet plays a vital role in the health of people of all ages [1]. A balanced, nutritious diet is essential for a healthy living. Eating and drinking not only satisfies our physiological needs but also have a deep symbolic significance. Optimal fitness needs good nutrition. It is often said "The mouth is a mirror of the body" as nutrition and oral health share a synergistic and multi-directional relationship [2]. In general the nutrients not only have an impact on general health but also do have an impact on oral cavity. In speaking of the fact, if nutrition is poor, the first signs often show-up in oral health [3]. The arrays of change in diet and energy outflow are related to the nutrition shift globally [4].

Dietitians, nutritionists, clinicians and dentists recognize diet and nutrition as an important tool in prevention of various diseases. They should be updated with all the available facts and information about the same.

Nutritionists and dietitians may project, synchronize and implement a range of population health mediations to improve the safety of individuals and societies through associating the fissure between diet and oral health.

Consistent health messages are required to be made available to the public and the need for dietary nutrition in accordance with dietary advice for general health be highlighted [5]. Precise knowledge and positive attitude about dental care is important for ideal oral health. Thus, this study was taken up with an aim to assess knowledge towards the effect of diet and nutrition on oral health among nutrition/ dietetics students of Udaipur city, Rajasthan, India.

MATERIALS AND METHODS

Study Design and Population: A descriptive cross-sectional study was conducted among all the nutrition and dietetics students of Udaipur city, Rajasthan, India, in the month of March 2014. All the nutrition/dietetics students were included in this study.

Ethical Approval, Official Permission and Informed Consent: The Ethical Committee of Pacific Dental College and Hospital cleared the study protocol and granted ethical clearance. Official permission was taken from the authorities of concerned institutes. Written informed consent was also obtained from the participants who were willing to participate.

Pre-testing of Questionnaire: A self-administered, structured questionnaire was developed and tested among a convenient sample of 20 nutrition and dietetics students, who were interviewed to gain feedback on the overall acceptability of the questionnaire in terms of length and language clarity. The questionnaire was amended based on the feedback. Internal reliability of the questionnaire was found to be 0.80 using Cronbach's coefficient. A panel of five academicians was set and mean Content Validity Ratio (CVR) was calculated as 0.87. Face validity was also calculated and 92% of the participants found the questionnaire to be easy.

Questionnaire: The designed questionnaire comprised of 14 questions and assessed knowledge among nutrition/dietetics students about effect of diet and nutrition on oral health. The participant's responses were ranked according to how much they agreed with each statement that was based on the 3 point Likert scale with alternatives: Disagree, Don't know and Agree. Information regarding their year of graduation and gender was also gathered.

Methodology: The information regarding the number of colleges for nutrition and dietetics course was gathered from different universities of Udaipur, Rajasthan, India. Investigator visited the institutes on pre-decided days for getting the questionnaires filled. All undergraduate students were given the questionnaires. The purpose of study was informed and explained to participants. Those willing to participate in the survey were requested to fill in the consent form and complete the questionnaire. The examiner was present in order to clarify any difficulties encountered during filling of questionnaire. Those who

were absent were followed on consecutive days for a period of 1 week in order to achieve maximum response.

The samples included in the pilot study were excluded from the main study. The final sample size achieved was 180. All the students were asked to rate each item of the questionnaire choosing the most appropriate option. A 100% response rate was achieved. Confidentiality and anonymity of the respondents were assured.

STATISTICAL ANALYSIS

Spreadsheets were created from coded questionnaires. The data was analyzed using SPSS 15. Responses to all items were coded from 1–3 (Disagree, Don't know, Agree). Descriptive statistics were used to summarize the demographic information. Student's t-test and one way ANOVA with post-hoc Bonferroni test was used to analyze the survey data. Confidence level and level of significance were fixed at 95% and 5%.

RESULTS

A total of 180 nutrition/dietetics students participated in the study [Table/Fig-1]. Demographic data showed that majority of the respondents were females (n=105, 58.3%) as compared to males (n=75, 41.6%). Majority of the population was in III year (n=68, 37.7%) followed by II year (n=62, 34.4%) and I year (n=50, 27.7%).

Majority (96.1%) of the nutrition/ dietetics students agreed that oral health is an integral part of general health. Role of diet in dental caries was affirmed by 93.9% participants. An 80% of them believed that frequent snacking causes dental caries. Most of them (93.6%) disagreed to the anti-cariogenic property of milk and cheese [Table/Fig-2].

Sample Characteristics	Frequency (%)
Sex	
Male	75 (41.6)
Female	105 (58.3)
Years of graduation	
I	50 (27.7)
II	62 (34.4)
III	68 (37.7)
Total	180 (100)

[Table/Fig-1]: Demographic characteristics of study population.

Items	Disagree	Don't Know	Agree
Oral health is an integral part of general health	4(2.2)	3(1.7)	173(96.1)
Dental caries is a chronic infectious disease	4(2.2)	173(96.1)	3(1.7)
Diet plays a role in dental caries	3(1.7)	8(4.4)	169(93.9)
Sucrose is the most cariogenic sugar	4(2.2)	173(96.1)	3(1.7)
Extrinsic sugars are more cariogenic than intrinsic sugars	4(2.2)	173(96.1)	3(1.7)
Fruit juices are more cariogenic than whole fruits	4(2.2)	173(96.1)	3(1.7)
Frequent snacking causes dental caries	16(8.9)	20(11.1)	144(80)
Frequency of sugar consumption plays a greater role in producing caries than does the total amount of sugar consumed	165(91.6)	7(3.8)	8(4.4)
Retentiveness of a food in the oral cavity is linked to dental caries	4(2.2)	173(96.1)	3(1.7)
Consuming sugar rich foods at meal time rather than alone decreases dental caries	4(2.2)	173(96.1)	3(1.7)
Tooth brushing/rinsing is advisable every time after food/drink consumption to reduce the chances of dental caries	2(1.1)	5(2.8)	173(96.1)
Milk and cheese are anti-cariogenic in nature	169(93.6)	7(3.8)	4(2.5)
Sugar substitutes reduces dental caries	174(96.7)	3(1.7)	3(1.6)
Fluoride prevents dental caries	4(2.2)	8(4.4)	168(93.4)

[Table/Fig-2]: Frequency of responses showing dental nutrition knowledge among nutrition/dietetics students.

Variables	Knowledge Scores (Mean±SD)	p-value
Sex		
Male	29.44±1.49	0.2
Female	29.75±1.78	
Years of graduation		
I	27.30±1.66 [a]	0.03*
II	29.56±1.27	
III	29.91±1.94 [a]	
Total	28.92±1.62	

[Table/Fig-3]: Association of mean knowledge with gender and years of graduation.
Statistical tests applied: t-test, one way ANOVA with post-hoc Bonferroni
* Indicates statistically significant difference at p≤0.05
Post-hoc Bonferroni test: Groups with same letter supra-script (a) show statistically significant difference

Mean knowledge of the study population was evident as 28.92±1.72. Mean knowledge scores for III, II and I year students were 29.91±1.94, 29.56±1.27 and 27.30±1.66 respectively. When post-hoc Bonferroni test was applied, mean knowledge score was found to be at a higher end among III year as compared to I year (p=0.03) students. Mean knowledge scores did not vary significantly with gender [Table/Fig-3].

DISCUSSION

As the human race has entered the 21st century, we have had access to a virtually unlimited supply of foods, processed to varying degrees. Mankind may be able to prevent caries and periodontal diseases, by simply improving diet and oral hygiene. Oral health and nutrition has an effect on craniofacial development, oral infectious diseases including cancer. Although dental problems show very less mortality rates, they have a considerable impact on self-confidence, eating ability, nutrition and are expensive to treat. It affects both the sexes, age groups, races and socioeconomic status groups [6]. Poor nutrition affects entire immune system, increasing susceptibility to disorders. People with lowered immune system have been shown to have increased risk for oral diseases which in turn could degrade systemic health. If nutrients are missing in diet, it becomes difficult for oral tissues to resist infection which may lead to tooth loss i.e., periodontal diseases. Eating a variety of well-balanced diet will improve dental health and increased fiber and vitamin intake will reduce the risk of other diseases. Many professionals like surgeons, dieticians, physicians have osculating interaction with the patients where they advise them about diet, but there is no information whether they take oral health into consideration before advising diet to the patients.

The nutrition/dietetics students of Udaipur city portrayed a low representation of dental nutritional knowledge. Our findings were in accordance to Paulo DA, who conducted a study on surgeon's knowledge about nutritional therapy, in which it was found that 80% of the surgeons were not confident in providing nutritional therapy and showed lack of knowledge [7]. In contrast, a study conducted by Faine MP et al., on Women, Infants and Children Nutritionists (WIC) and dental hygienists showed that they had significant greater dental nutritional knowledge [8]. This may be because of the curriculum dental hygienists study.

In spite of 96.1% participants agreed to the fact that oral health is an integral part of general health, their knowledge regarding dental nutrition was low electing the need of incorporating an introduction to dental nutrition science. A total of 96.1% of the study participants did not have an idea whether extrinsic sugars were more cariogenic compared to intrinsic sugars. Similar were the findings when they were asked about the cariogenicity of fruit juices when compared to whole fruits. Health reports throughout the world encourage increased consumption of fruits and vegetables [9] with a minimum

intake quoted as 400gm per day or five portions [10]. In 1989 UK Committee on Medical Aspects of Food Policy recommended that in order to reduce the risk of dental caries, consumption of extrinsic sugars should be decreased and that these sugars should be replaced by fresh fruits, vegetables and starchy foods [10]. From dental point of view, it is also preferred to consume whole fresh fruit as opposed to juices, because mastication stimulates the salivary flow creating a washing effect. In accordance to Edgar WM [11] fruit juices contain extrinsic sugars which are more cariogenic than intrinsic sugars present in fresh fruits. Banan LK et al., also showed that fresh fruit juice especially citrus fruits, have been identified as contributing to dental erosion and cause a greater drop in plaque and salivary pH [12].

In our study 96.1% nutrition/dietetics students were not aware that sucrose is the most cariogenic sugar. A study conducted by Raner E et al., in Thailand indicated that the children and adults had low plaque physiology and microbiology, which has been accounted to their low sucrose intake which could explain the low caries prevalence in this population [13]. Other milestone studies like Vipeholm study and Turku Sugar studies have also shown similar findings [14]. In our study 96.7% disagreed that sugar substitutes reduce dental caries. Sweeteners are not metabolized to acids by oral microorganisms; thus, they cannot cause dental caries. Xylitol is found to be non-cariogenic according to studies conducted in Russia, Hungary, and Estonia [15]. Also, there is a wide range of non-cariogenic sweeteners available for caries control in the market.

Majority of the participants were aware of the fact that frequent snacking causes dental caries which was in accordance with the findings of studies conducted by Faine MP et al., and Palmer CA et al., among nutritionists [8,16]. However, they were unaware regarding, influence of frequency of consumption than the quantity of sugar consumed. Hankin JH et al., conducted a study on 14-year-old Caucasian, Hawaiian, and Japanese school children in Hawaii and found a positive correlation between the frequency of consumption of confectionery and sugar containing gum [17].

Maximum participants (93.6%) disagreed to the anti-cariogenic nature of milk and cheese. Cheese stimulates salivary secretion and increases plaque calcium concentration. A study conducted by Telgi RL et al., showed that cheese increased plaque pH after 30 minutes compared to other dairy products [18]. In addition, other studies [19,20] have attributed anti-cariogenic properties of milk to the presence of casein, calcium and phosphate. These assist in remineralization of de-mineralized enamel surface.

A total of 93.4% of the participants in our study agreed that fluoride prevents dental caries. But in contrast a similar study conducted in Bengaluru by Bhat PK et al., only 13% felt fluoride was protective against dental caries [21]. Exposure to fluoride in some countries has altered the sugar-caries relationship. It has been argued that where fluoride is present in drinking water at a concentration of 0.7ppm-1ppm, the dose effect curve shifts and raises the safe limit on the levels of sugar. Fluoride inhibits the demineralization process and the frequency of fall of plaque pH below the critical pH level [22].

This study not only reinforces the need for implementing training of nutritionists regarding oral health knowledge but also calls for all other disciplines to come together and join hands for collaboration. This methodology has a goal of maintaining an individual's health and improves outcomes. Students of different professions when trained together are more likely to become collaborative team members who could work with a positive attitude towards each other [23]. A nutritionist has a role in improving health by diet evaluation and personalized advice. Based on health goals or medical needs, the nutritionist can make recommendations and counsel a patient and put together plans. Hence, if they have adequate dental nutrition knowledge they could also play a key role to unlock good oral health.

LIMITATION AND RECOMMENDATION

However, it is acknowledged that this study is limited to one geographical location and the results cannot be generalized throughout the country. This study highlights the low dental nutrition knowledge among nutritionist/dietetics students. Hence, it is necessary to develop and train health professionals in more culturally-acceptable methods of promoting prevention and self-care in their practice. Elimination of conflicts among professionals is crucial if the health of the patient is to be improved. Nutrition programmes regarding oral health should be tailored to address other professionals so that they may use this information and embark a positive oral health attitude towards the patients when prescribing diet.

CONCLUSION

It was concluded that nutrition/dietetics students had low dental nutrition knowledge. They were unaware of the various aspects of oral nutrition that is correlated to general nutrition. These health professionals should have more information outside their immediate fields. Inter-professional team members should have positive mind set and collaboration amongst each other. They should work together towards improving patient outcomes.

CONFLICTS OF INTERESTS

The authors declare that there were no conflicts of interest in the present study. There was no sponsorship of any kind from any organization.

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