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An Analysis of the Impact of Poor Food Education on Dental Caries among Adolescents in Peshawar

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Abstract

Objective: *The study was carried out to determine the causes of prevalence of dental caries among adolescents in Peshawar particularly the type of food causing caries and to quantify the data on food education and dental caries among adolescents in Peshawar. An analytical cross sectional study to determine the prevalence of caries among adolescents of age16-18 years was done in Peshawar. Total sample size was 100 adolescents. Data were collected through a self-administered questionnaire. The results show that poor food education positively correlated to dental caries. It was concluded that food education is lacking in Pakistan and to reduce the number of Dental Caries, the Education Department should include Food Education in the curriculum of high school. In addition to this the Health Department should regularly run campaigns promoting Food Education on electronic and print media.*

Keywords: Food Education, Dental Caries, Carbohydrate Rich Foods, Acidic Foods, Xerostomic Agent

Introduction

Good health and proper nutrition are significantly correlated whereas an unhealthy diet and a sedentary inactive life style are the main reasons for rising illnesses and diseases across world. **Palacios *et al.*, 2019.** A vital association is found between carbohydrates and oral health. The type of diet a patient consumes has an influence on the structure of the teeth, the amount of saliva produced, the quality of saliva and the resultant biofilm formation in the oral cavity. The carbohydrates consumed by the patient are broken down by salivary enzymes and provide a stable surface for the activity of bacteria in the oral cavity which leads to the formation of plaque and demineralizes the surface of the teeth. **Touger and Loveren 2003**.

Foods rich in acidic content increase the solubility of calcium hydroxyapatite and cause demineralization. **Moynihan and Petersen 2004.** The loss of the mineral structure of the teeth occurs with a disturbance in the pH of the oral cavity i.e. when the pH level decreases to less than 5.5. The process of remineralization of the tooth structure depends on the increase in the level of pH which usually occurs with the consumption of fluoride. When the process of dental caries is initiated, there is usually an imbalance between the phenomena of demineralization and remineralization, in which remineralization of the tooth structure occurs much more slowly than demineralization. The relationship of these

two processes with the dietery intake is that the diet may tamper with the balance between the demineralization and remineralization of the tooth structure. A diet which is rich in sugars will promote the growth of acid producing bacteria in the oral cavity which lowers the value of pH whereas a diet which has decreased amount of fermentable sugars will favor remineralization.

Generally students skip their breakfast that in turn leads to consumption of carbohydrate rich meals in the form of snacks that build a carious lesion overtime. **Iftikhar *et al*., 2012.** It is of essential importance to restrict the consumption of cariogenic sugars or carbohydrate rich food in between meal times. During meal times the salivary flow is enhanced which washes out any residual food particles found in the oral cavity. Hence the practice of snacking in between meals should be refrained from **Sanz *et al*., 2013**.

Snacks contain an abundant amount of sugars, salt and fat which categorizes them as food low in nutrients. Overnutrition is usually linked to the replacement of nutritious food with snacks. The excessive intake of carbonated drinks, sweets, chips and confectionary leads to overnutrition and provides the child with an increased amount of calories to the child which in turn predisposes the child to carious lesions. **Tinanoff and Palmer 2000.**

Tooth decay remains widespread and is increasing in some emerging nations. Research shows that ingesting starchy discontinuous garden-fresh fruits are associated with a low incidence of tooth decay. Fluoride lessens the risk of caries, but does not eliminate tooth decay.

For adolescents, the food taken in schools makes up an important part of their diet. The ingestion of fruits and vegetables in the diet provided at school has been associated with how readily they are available in school lunch programs. In 2008 a study was carried out in the United States, in which it was reported that food provided in School Lunch Programs was usually nutritious but it also raised awareness among policy makers about the presence of a high amount of carbohydrates in the food provided.[6]

Kunitomo *et al*., 2016 observed that in Japan, curriculum on whole foods are made in order to improve eating habits and decreasing the occurrence of ailments connected to lifestyle, including dental caries. The resolve of Kunitomo M. prospective cohort study was to examine the relationship amid awareness of shokuiku (curriculum) and the upsurge of dental caries amongst Japanese college students who had participated in a shokuiku (curriculum) program in junior/senior high school. A total of 562 students agreed to undertake oral inspections in the course of a three-year follow-up period, throughout which the amount of cases of dental caries were recorded **Mobley *et al*., 2009**.

The significance of this study is to highlight how data on the quantification of poor food education and caries is deficient in medical and dental literature in reference to Pakistan. Hence the present study is aimed to provide quantified data on the correlation of food education and dental caries and the use of this data to improve the quality of life of adolescents by increasing awareness of cariogenic foods through education and decreasing the prevalence of caries which in turns leads to better smiles and a boost in confidence due to an acceptable appearance. In addition the present study will also help stake holders in planning National Education Policy regarding Food Education. The study has carried out to achieve following specific objectives. To determine the causes of prevalence of caries among adolescents in Peshawar. To quantify the data on Food Education and Dental Caries among adolescents in Peshawar.

Hypothesis

H_o: Poor Food Education positively impacts the incidence of Dental Caries.

Materials and Methods

An analytical cross sectional research design is adopted to conduct the study. Inclusion criteria comprised of patients suffering from dental caries aged 16-18 years of both sexes. Immunocompromised patients, patients suffering from any oral manifestation of an underlying systemic disease and salivary gland pathology were excluded from the study. Data were collected from dental hospitals as well as from dental clinics in Peshawar. A structured questionnaire was used. The questionnaire contained self-structured close ended questions. The sample size was 100 where 50 were female patients and 50 were male patients. The data was collected during the April – May, 2017.

The following research model was adopted to achieve the research objectives.

Dependent variable: Dental Caries

Independent variables: Food Education (Carbohydrate Rich Food, Frequent Snaking, Low-Quality Food (Improper Nutrition), Low-Fluoride Food, Sticky Food, Acidic Food, Xerostomic Agent)

DC=f(CRF, FS, LQF, LFF, SF, AF, XA) (i)

Where

DC = Dental Caries

CRF = Carbohydrate Rich Food

FS = Frequent Snaking

LQF=Low-Quality Food (Improper Nutrition)

LFF=Low-Fluoride Food

SF=Sticky Food

AF=Acidic Food

XA= erostomic Agent

$DE=b_o+b_1CRF+b_2FS+b_3$ $LQF+b_4LFF+b_5SF+b_6AF+b_7XA+ei$ ----- (ii)

Results

The results obtained are reproduced for further discussion, as follows:

Model	1
R	0.962
R-square	0.9440
Adjusted R-square	0.9430

F = 957.280

DC= 0.254+0.466CRF + 0.105FS + 0.0140 LQF + 0.0225LFF+ 0.049SF + 0.0672AF+ 0.235XF

(2.628) (3.582) (4.348) (1.121) (1.545) (2.201) (23.556)

(Figures in parenthesis are t-ratios)

F value suggests that model is overall significant. All variables are significant on the basis of t-ratios; it is only one variable (LFF), which has lower t-value (1.121) than its critical value (t = 1.282).

Discussion

Conferring of statistical diagnostics the results obtained from collected /analyzed data are good in fit. The empirical results, given above, appear to be very good in terms of the usual diagnostic statistics. Value of R is 0.962 which illustrates substantial correlation between dependent variable DC and its determinant Food Education (CRF, FS, LQF, LEF, SF, AF, and XF). The values of R Square, as well as, Adjusted R Square indicate that 94% of the dental caries in adolescents in Peshawar are caused due to poor Food Education.

The above result shows that Carbohydrate Rich Food positively correlated to Dental Carries followed by xerostomic agents. Similarly other factors of Food Education are also positively correlated to Dental Carries. In view of foregoing the Ho: Poor Food Education positively impact Dental Caries is accepted.

The above study shows that education about nutrition is of prime importance in reducing the incidence of dental caries. If parents, teachers and healthcare providers are better educated about the different types of food consumed by the school going children and about the effects of each food group on the incidence of dental caries, the incidence will decrease dramatically. Dietary counseling leads to awareness about the type of food consumed and in turn controls the dietary behavior of children. Selection of diet which contains a lesser amount of carbohydrate rich food will decrease the rate of dental caries. The aim should be to adapt dietary behaviors that help to improve the oral health.[8]

Conclusions

The data collected showed that the knowledge of oral health and hygiene in adolescents of Peshawar is not up to the mark more over Food Education is a neglected part of our curriculum at high school level. The analysis of collected data further indicated that Poor Food Education positively affects Dental Caries hence it is suggested that to reduce the formation of dental caries, the Education Department should include Food Education in the curriculum of high school. In addition to this the Health Department should regularly run campaigns promoting Food Education on electronic and print media.

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