



IMPACT OF FOOD PREFERENCES ON THE DEVELOPMENT OF PATHOLOGICAL CHANGES IN THE MASTICATORY APPARATUS IN YOUNG PATIENTS

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ABSTRACT:

Food can have a mighty biological, therapeutic and preventive effect, yet its breakdown can provide the perfect setting for tooth decay and its implications, *diseases of the periodontium and the oral mucosa*. Due to the high incidence of periodontal and hard dental tissues pathologies among adolescents they have been ranked as socially significant diseases. A damaged dental-jaw apparatus may lead to forming unhealthy eating habits, more sensitive food preferences and *nutritional deficiency*.

The objective was to explore the prevalence of those diseases and the dental hygiene among *final year high school students* as well as to seek any correlation with their eating habits and preferences.

Materials and Methods: The study involved 121 students who underwent extraoral and intraoral examination in order to establish the state of the masticatory apparatus whereas the state of *oral hygiene was measured as per Silness-Löe plaque index*. A questionnaire filled out by the students provided data on the individual characteristics of the masticatory process, eating habits and frequency of consumption of certain cariogenic and anticariogenic foods and beverages.

Results: The findings revealed unhealthy food preferences in the target group. The unsatisfactory oral hygiene habits and food preferences account for the high percentage of dental caries.

Conclusion: Oral health of children and adolescents is problematic worldwide and can be resolved with the benefits of a balanced diet as well as personal and professional oral hygiene, etc. Teaching children the importance of proper oral care before reaching adolescence can build anticariogenic habits in them for a lifetime.

Keywords: dental caries, eating habits, cariogenic foods and beverages, anticariogenic foods

Diseases of the masticatory apparatus are among the most common chronic diseases and have become a significant public health issue owing to the increasing number of patients affected by them and the correlation with a

number of other common diseases. [1] Due to the high incidence of periodontal and hard dental tissues pathologies among adolescents they have been ranked as socially significant diseases. [2] These issues play an important role in the etiology of many infectious, cardio-vascular, metabolic diseases, etc. [3] Evidence pointing to the fact that more and more teenagers enter adolescence with an already impaired dental-jaw apparatus is quite alarming. The relationship between dietary preferences and masticatory efficiency has been investigated by a number of authors. [3, 4] The link between the beneficial effect of certain foods, among which fish, nuts, vegetables, etc., and the proper functioning of the human body have long been acknowledged. [5, 6, 7, 8, 9] Those studies urged us to shift our attention to the potential link between food preferences of young patients and their oral health.

The objective was to explore the prevalence of dental caries and the level of dental hygiene among *final year high school students* as well as to seek any correlation with their eating habits and preferences.

MATERIALS AND METHODS

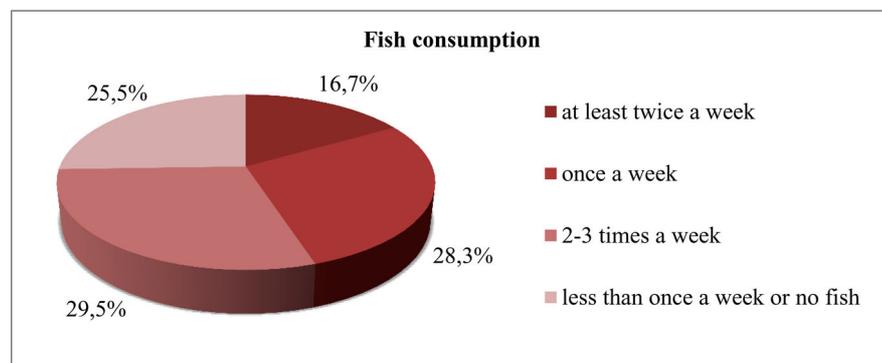
A pilot screening was performed targeted at final year high school students to establish the state of their masticatory apparatus and their food preferences. The study involved 121 students in overall good health, whose participation was random and voluntary. The target group underwent a laboratory analysis of serum concentrations of vitamin D3, extraoral and intraoral examination to detect the presence of hard dental tissues pathologies whereas the level of *oral hygiene was measured using Silness-Löe plaque index*. A questionnaire filled out by the students provided data on the individual characteristics of the masticatory process, eating habits and frequency of consumption of certain cariogenic and anticariogenic foods and beverages. The data were analyzed using SPSS software for epidemiological and clinical research (Windows, V 17.0.0, Aug. 2008). The following statistical methods were applied: frequency and percentage distribution of data, correlation analysis, graphical representation of data.

RESULTS

The findings revealed an unhealthy trend of food preferences in the target group. Hard nuts and fish are among the foods having strong protective effect on dental health. Fish is a good dietary source of complete protein, essential fats and vitamin D. Each of these nutrients is related to dental health. We studied the amount of fish consumption among students in Varna, a city of traditions in

the consumption of seafood. The findings showed that only 16.7% of students consumed fish two or more times a week, as recommended [6, 7], while with more than half of the surveyed (55% of the students) fish consumption was so low that there was a potential risk of Hypovitaminosis D during the winter season (Figure 1). Fish consumption in that period is the most important in the protection of dental health.

Fig. 1. Percentage distribution of respondents in the questionnaire on fish consumption



Our findings strongly matched the results reported by other authors. The study of eating habits of students in 10th grade from Sofia revealed that only 7% of them consumed fish on a weekly basis [1]. The analysis of fish consumption data obtained from Varna students indicated those consuming least fish were young people aged under 20 years, whereas the population over the age of 60 had fish most often most [5]. It is quite alarming that in a city of culinary traditions in fish consumption there is a tendency for low fish consumption by children and young people. This shift in food patterns increases the risk of Hypovitaminosis D among the young generation and thus exposes it to a number of socially significant diseases, such as dental caries [4]. A laboratory analysis of serum concentrations revealed that in 11% of respondents (13 adolescents) there was a serious deficiency of vitamin D3 (25-OH), for 46% of students the values were below 12.0 ng/ml, and in 30.7% the deficit was 12-30 ng/ml (n=4). Satisfactory levels of vitamin D3 (above 30 ng/ml) were measured in only 3 final year students (23.3%).

Nuts are among the so called anticariogenic foods [10, 11, 12]. They are rich in protein and essential fats and contain a small amount of complex carbohydrates and fiber. Their nutritional value accounts for their most beneficial effect on dental health [8]. The results of the survey showed that 7.5% of students consumed nuts every day, 32% - at least twice weekly, 31% - once a week, 23% - 1-2 times a month, and 5.5% consumed less or no fish at all. The most preferred nuts appeared to be peanuts, almonds

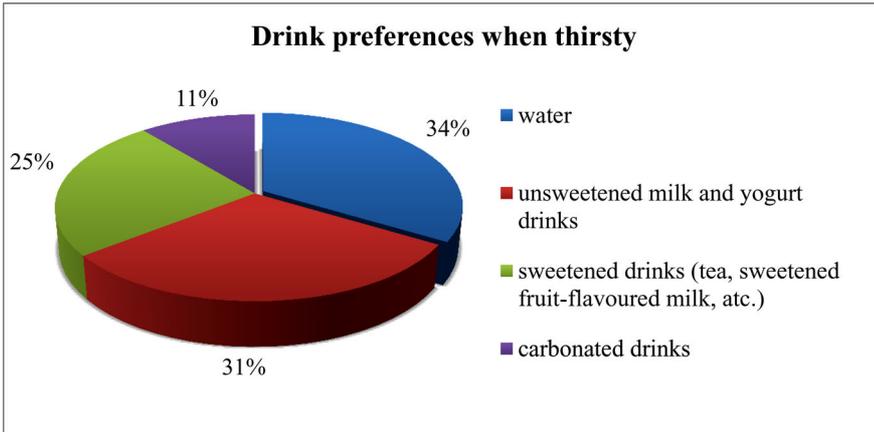
and hazelnuts (69%, 42%, 38%, respectively). Less frequently young people reached for nuts and sunflower seeds (33%, 27%, respectively). A small proportion of respondents chose raw and unsalted nuts (28%), most favoured salted (85%), roasted (79%) or fried (6%) nuts.

The consumption of nuts within the target group was satisfactory. However, young people's preference for salted and processed nuts to raw nuts was unsatisfactory as those processes diminish their health benefits.

Students' preference for soft drinks is also important to consider. About 34% of students (1/3) quenched their thirst with water, 31% of them mostly consumed unsweetened milk and yogurt drinks, 25% had sweetened drinks (tea, juice, sweetened/fruit-flavoured milk), and 11% preferred carbonated and energy drinks.

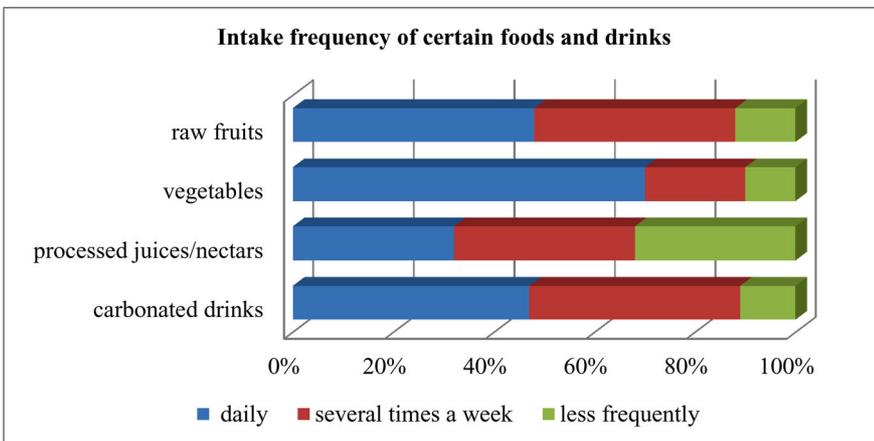
Raw vegetables have protective effect against dental caries. They are part of the daily diet of 2/3 of students (74%). 23% of respondents shared that their vegetable intake was several times a week, while 13% had them less frequently. 48% of students consumed fresh fruit daily, whereas 40% had them several times a week. Only 12% of respondents did not have fruit regularly. Every third student drank processed fruit juices and nectars daily. 37% of children admitted to having juices regularly throughout the week, whereas about 1/3 of the respondents consumed them less frequently or thoroughly avoided them. (Figure 2)

Fig. 2. Percentage distribution of respondents in the questionnaire on drink preferences when thirsty



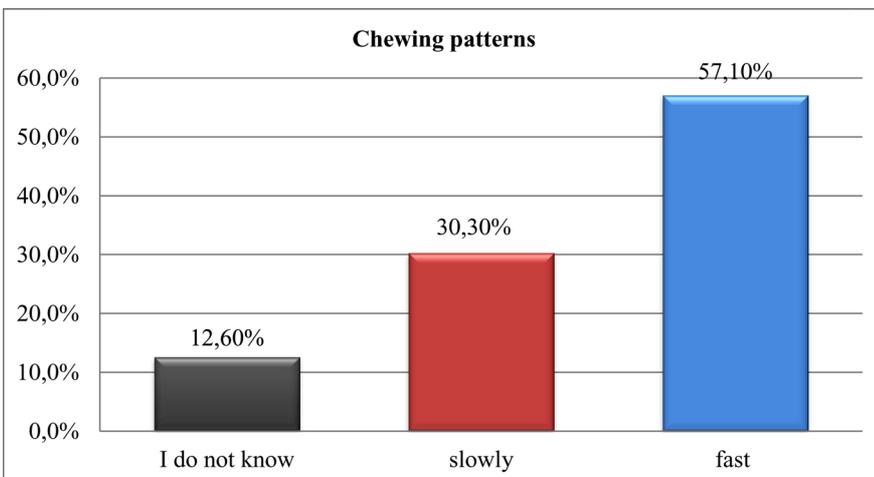
Nearly half of the students (47%) drank carbonated drinks daily, while 42% consumed them several times a week. Only 11% avoided them. (Figure 3)

Fig. 3. Percentage distribution of respondents in the questionnaire on intake frequency of certain foods and drinks



The hectic lifestyle nowadays has an inevitable impact on the eating stereotype of young people. Nearly 57% of them realized that they ate quickly without chewing the food enough times prior to swallowing. (Figure 4)

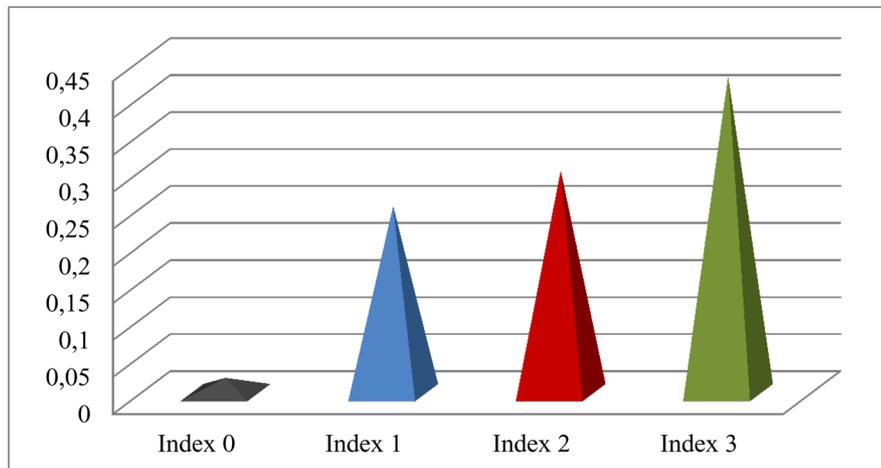
Fig. 4. Percentage distribution of respondents in the questionnaire on their chewing patterns



Nowadays the quite common fast chewing pattern is often implicated in the fast food preferences of young people. 80% of polled adolescents preferred soft-textured foods; 7.60% chose normal textured foods, 12.40% consumed food with any texture and an alarming rate of 0.00% preferred solid food.

The consumption of foods in their natural form (fruits, vegetables, nuts) is recommended to stimulate the natural self-cleansing action of the mouth. Personal oral hygiene is undoubtedly the main factor in oral health. The findings on the oral hygiene state of patients surveyed are quite worrying. (Figure 5)

Fig. 5. The state of oral hygiene measured using Silness-Löe plaque index.



The Silness-Löe plaque indices obtained in our study showed that nearly half of respondents (42.80%) were given Index 3, i.e. plenty of soft material was scraped off the probe. 30% displayed moderate buildup of plaque and were assigned Index 2. 25.20% had Index 1, i.e. there was no visible plaque, still a small amount was scraped. Only 2% of all patients surveyed were given Index 0.

The data showed that 91.94% of patients had never been subjected to professional oral hygiene, 4.03% reported that once every 3-4 years they resorted to professional care, while 4.03% visited the dentist for regular checkups as well as professional oral hygiene every 6 months.

The unsatisfactory oral hygiene habits and food preferences for cariogenic foods account for the high percentage of dental caries. The following disturbing trend was observed: 83.60% of boys surveyed and 78.90% of girls had at least one dental caries. A statistically significant correlation between young people's oral hygiene state and the presence of active carious lesions was noted ($P = 0.020$).

As findings showed, negligence of basic anticariogenic factors naturally led to a large percentage of subsequent complications (35%), including deep fractured teeth, radix reliqua (21%) and tooth loss (14%).

DISCUSSION

The results obtained from the study disclosed a high incidence of dental caries and poor oral hygiene habits.

The trend towards unhealthy food preferences was implicated in the etiology of dental caries: 30% of students drank sweetened juices daily and 47% had sweetened carbonated beverages. The study also established insufficient consumption of fish and nuts, which are foods with proven anticariogenic effect. Fish was part of the daily diet in 16.7% of students surveyed, whereas nuts were often consumed by nearly 32% of them. Most young people (85%) preferred salted and roasted nuts to natural raw nuts, thus diminishing their dental health benefits. A significant part of students daily consumed fresh fruit (48%) and vegetables (74%).

CONCLUSION

Oral health of children and young people has been a serious issue worldwide. It can be resolved with the benefits of a balanced diet as well as personal and professional oral hygiene, etc. This implies the collaboration of parents, teachers, dentists and nutritionists. Teaching children the importance of proper oral care before reaching adolescence can build anticariogenic habits in them for a lifetime.

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