ANALYSIS OF THE RISK FACTORS OF DENTAL CARIES

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Abstract
According to World Health Organization data and statistics, dental caries is the leading oral disease by the frequency of occurrence. Tooth decay affects the people worldwide, becoming a major burden for the oral health. A large number of studies in the field have identified a series of risk factors that are responsible for causing dental caries. Therefore, in order to prevent this condition, we should put an emphasis on oral hygiene, healthy diet and food habits, frequency of visiting an oral health professional and relevant sources of information on oral health. For the study upon the risk factors concerning dental health, I applied a survey questionnaire on a sample of 514 adult people (over 18 years old). If we analyze the results, we can observe that 76.07 percent of the survey respondents change their toothbrush every three months, but 17.51 percent do not use additional hygiene practices. Regarding the dental visits, 44.16 percent of the survey respondents visit their dental practitioner only when they are in pain and less for a regular dental exam. Concerning the fruit and vegetables consumption, 31% of the survey respondents state that they have a poor consumption. To sum up, based on all the questionnaire data, there is a low interest of the population in their oral health, due to the lack of information on the risk factors. Despite the many oral health promotion campaigns, the results are not yet notable. It is significant that these campaigns should continue without interruption, differentiated by age groups, involving dentists, dental nurses, school teachers and the authorities.

Key words: dental caries; risk factors; patient behavior; quantitative analysis

1. Risk factors of dental caries

The tooth decay process is irreversible and has a long evolution, so it is often neglected by the patients. At the World Congress of Preventive Dentistry, The World Health Organization has placed the dental caries as the most prevalent among the oral diseases, according to the data presented, thus becoming a national and global problem because of the general health state of the population, as the dental caries increases the risk of developing digestive, cardiac, rheumatic or renal diseases by maintaining the infectious outbreak. At the same time, the aesthetic aspect of the patient is affected, along with the change in the social behaviour, the patient becoming more withdrawn.

According to a study of the National Institute of Public Health carried out through the National Centre for Health Evaluation and Promotion of Health (CNEPSS) in 2012, on a sample of 2851 children and adolescents, it was found that, at national level, the prevalence of dental caries was 3.39 caries per child.

The county with the highest average number of dental caries was Bistrița Năsăud with 5.07 caries per participant, and the minimum average number is in Galaţi County (1.23 caries per participant). Regarding the conditions for the dental caries incidence, numerous studies have shown that the tooth decay process is not present in the teeth that does not come into contact with the oral environment. From this we conclude that the risk of carious lesions occurs with the eruption of temporary teeth. With the onset of dental eruption, several contributing factors arise. Among the most important factors included are:

- the mineralized state of the dental structure-in case of the lack of calcium and mineral salts, the enamel has a low resistance to the aggressiveness of the microorganisms;
- the amount of saliva that promotes self-cleaning–the salivary flow removes interdental food remnants. When the amount of saliva decreases, these remnantsare maintained and ferment, thus creating a pH acid that affects the dental enamel;
- the bacterial plaque formation by the modification of the local pH - bacteria located on the dental surface modify through their metabolic activity the oral pH into an acid that affects the dental structures;
- the shape of the teeth and their position on the arcade - it was clinically observed that the lateral teeth (premolars, molars) can exhibit deep grooves on the occlusal surface, retaining food and creating difficulties in the self-cleansing process;
- eating habits that involve excessive consumption of carbohydrates and carbonated beverages to the detriment of dairy, fruit and vegetables. Excess carbohydrates (sugars) is an important factor in the adherence of food to the dental surface and also a nourishing substrate for acidogenic bacteria. Instead, dairy and fruit provide an intake of calcium, mineralsand vitamins essential for the resistance of dental tissues.

These factors may be associated with general disorders such as endocrine, thyroid, sexual or somatotropic disorders that can alter the moment of dental eruption, the mineralization of dental tissue, and saliva viscosity (salivary gland inflammation, salivary calculi, radiotherapy).

The carious process affects the entire population of the planet, so it has become a major problem in oro-dental health, to which we have to pay due attention.

2. Results

In the study based on the questionnaires we proposed to analyse the degree of exposure of the population to risk factors for dental health, as well as the degree of health education on oral hygiene. Thus, we conducted a prospective cohort analytical study on a sample of 514 adult adults aged over 18 years. The respondents are students of the post-secondary health schools and the questionnaire was distributed, with their consent, including a consent for data processing. This questionnaire was distributed between September 2016 and September 2017 and included questions about dental hygiene, the frequency of visits to a dentist, eating habits and sources of information on dental hygiene.

Of the 514 trainees who participated in this research, 415, representing 76.14% of the respondents, came from the urban area and only 99 trainees declared that they live in rural areas, representing 23.86%.

Table 1. Frequency of dental brushing among participants

Frequency of dental brushing	Number	%
Rare	10	1
One/day	67	14
Twice/day	493	58
After every meal	343	27

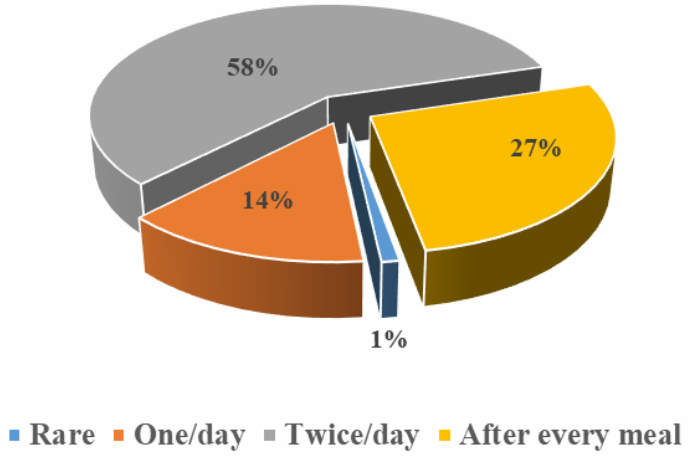


Figure 1. Frequency of dental brushing among participants

Table 2. Type of toothbrush

Type of toothbrush	Number	%
Hard	64	6
Medium	623	52
Soft	60	20
Electric	320	22

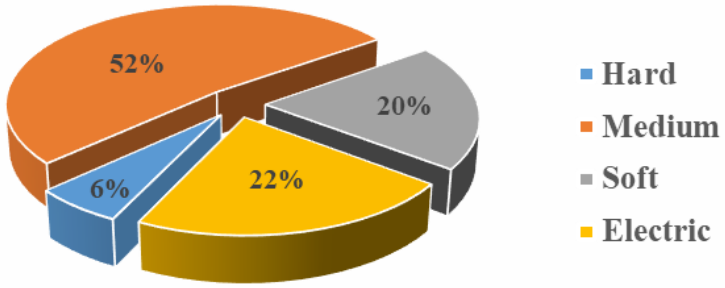


Figure 2. Type of toothbrush

Table 3. Toothbrush replacement

Time interval	Number	%
3 months	**391**	**76,07**
6 months	**99**	**19,26**
12 month	**24**	**4,67**

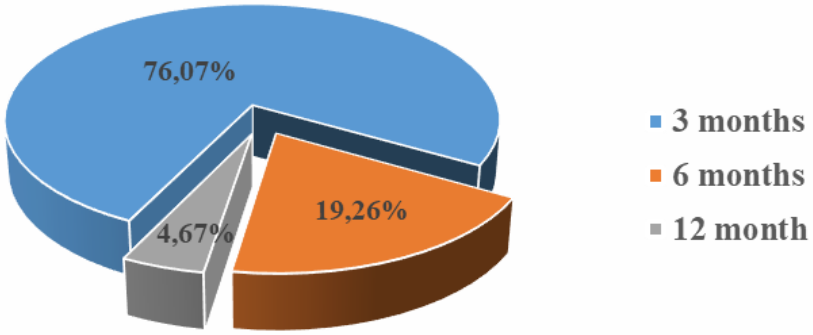


Figure 3. Toothbrush replacement

By analysing these charts, we can note that although 58.17% of the respondents perform dental brushing both in the morning and in the evening, a percentage of 14.98% brush their teeth once a day or less than once a day. The importance of dental brushing is generated by providing 93.77% of the individual's health and less emphasizing beauty or aesthetics. A fairly high percentage of the interviewees, namely 83.05%, use a correct choice of toothbrush, medium bristled brush and electric brush, respectively.

While 76% of respondents replace the toothbrush every 3 months, there are still some who replace their toothbrush every 6 months or even once a year. This demonstrates an insufficient knowledge of maintaining good dental hygiene and increased risk of tooth decay, due to the accumulation of bacterial plaque.

Table 4. Use of other hygiene tools

Other means used	Number	%
Dental floss	156	30,35
Mouthwash	104	20,23
Dental scaling	5	0,97
Mouthwash and dental floss	164	31,91
Did not respond	85	16,54

Table 5. Information sources in dental hygiene

Information sources	Number	%
Advertising materials	158	30,74
Internet	133	25,88
Dentist	223	43,38

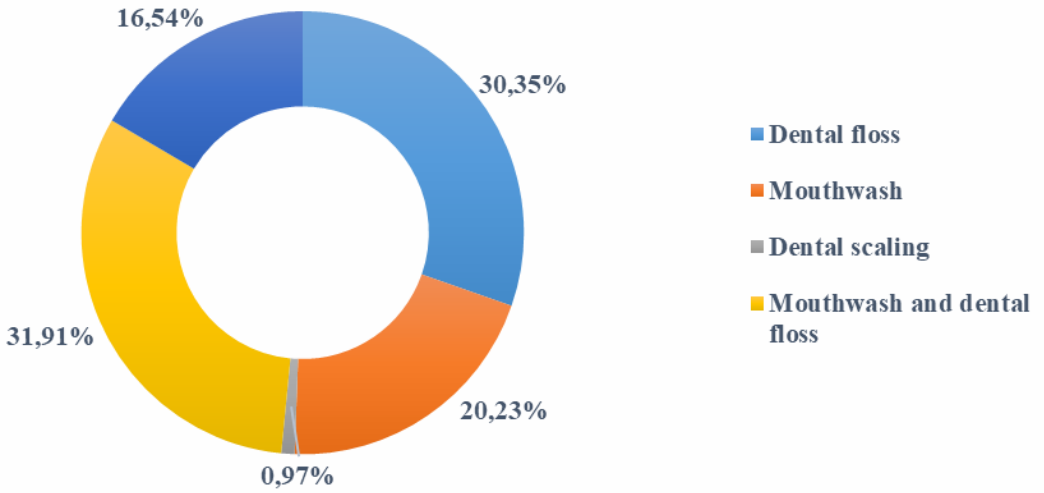


Figure 4. Use of other hygiene tools

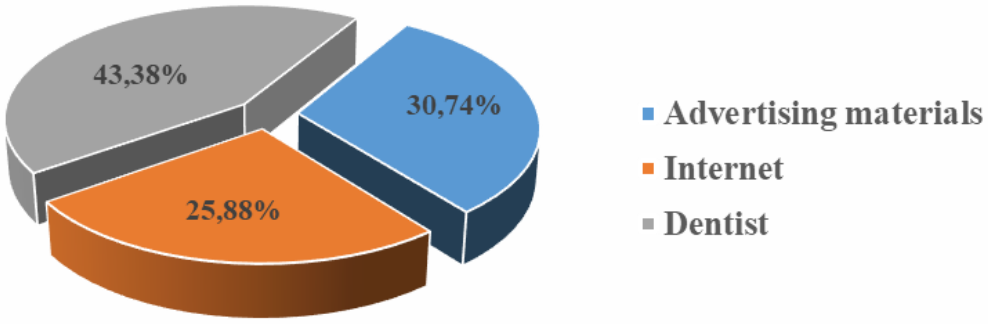
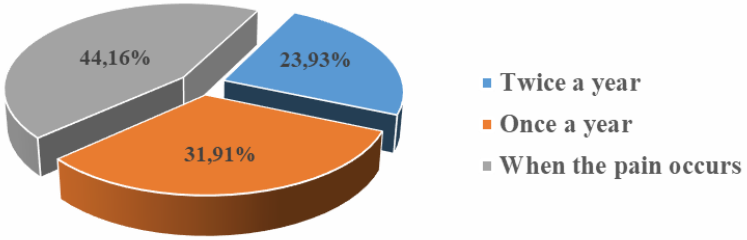


Figure 5. Information sources in dental hygiene

The centralized data in these two tables have shown that only 31.91% of the respondents use dental floss and mouthwash as additional oral hygiene tools, the others usingtheoral hygiene means partially or not at all, limiting their dental care only to toothbrush and toothpaste. One of these causes is also the fact that only 43.38% of the respondents are informed by the dentist about the means and modalities of maintaining their oral hygiene, the rest confining their information to the documentation provided by the Internet and various advertising materials. Most of the advertising materials regarding health, in general and oral health, in particular, are usually of a purely commercial nature and do not provide the best personalized information as tools, treatments and maintenance techniques.

Table 6. Frequency of dental examinations

Frequency of examinations	Number	%
Twice a year	123	23,93
Once a year	164	31,91
When the pain occurs	227	44,16



Graphic 6. Frequency of dental examinations

We can notice that only 23.93% of the respondents get their dental examination twice a year, correctly, while it is worrying that 44.16% of the respondents go for their examination only when the pain occurs, therefore only in emergency situations. This indicates poor individual concern for oral health and a low level of health education. Given that the individuals in the analysed sample are of adult age (22 years and over), the result shows that they did not benefit from proper health education in the childhood, which could also represent a risk of incorrect information on this issue for their future children.

Table 7. Consumption of carbonated soft drinks

Consumption	Number	%
Do not consume	70	13,62
Daily/ very often	196	38,13
Occasionally	248	48,25

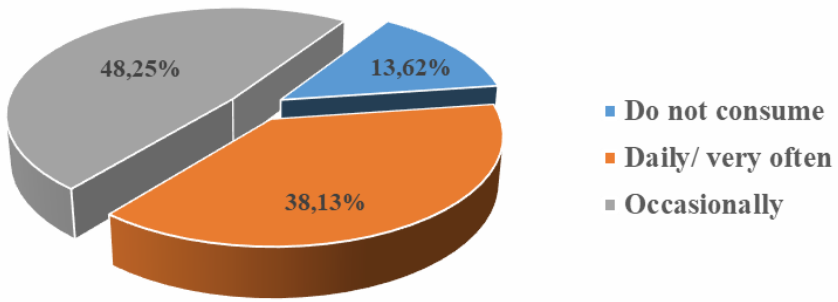


Figure 7. Consumption of carbonated soft drinks

A quite large number of respondents often consume carbonated soft beverages, 38.13%, which increases the risk of dental caries due to their high content of sugars. As far as the consumption of sweets is concerned, we observe that 58.76% of respondents consume sweets daily, which means a high content of carbohydrates, which, associated with carbonated beverages, favours the carious process.

A total of 167 people surveyed perform their mastication unilaterally and not bilaterally, as normal for a healthy dentition, while preferring at the same time soft food and having bleeding during dental brushing. The same category prefers dental brushing with soft toothbrushes, thus leading to ineffective maintenance.

This demonstrates that these people show signs of dental disease, gingival inflammation and an increased risk of caries formation. Clearly, they are among the patients who fail to visit their dentist frequently and constantly, but only when the pain occurs.

Concerning the consumption of fruit and vegetables, 31% of the respondents rarely consume these foods, which leads to a low intake of vitamins. Vitamin deficiency leads to a decrease in periodontal tissue resistance, from which we conclude that there is a risk of developing gingivitis or various forms of periodontitis.

At the European level, the oro-dental health situation of the population in our country is not optimistic at all. Thus, the report of the European Platform forBetter Oral Health2012 shows that Romania is ranked last in Europe on the budget allocated to oral health and the International Agency for Research on Cancer in 2016 places Romania on the 9th place among the European countries regarding the new cases of oral cancers and on the 8th place as the mortality rate from them. According to the Eurobarometer surveyon the oral health of citizens of EU member states, 41% of Europeans have natural dentition while in Romania only 30% do not have dentures. Most Europeans say they have not experienced dental discomfort in the past year and 15% have had difficulty masticating, unlike in Romania where the percentage is 32%.

A percentage of 7% of European citizens are embarrassed by their dentition, while in Romania the percentage is 16%, which ranks us first in Europe.

While European citizens are visiting a dental practitioner for a routine examination twice a year, on average, in our country about 42.09% do not visit their dentist at all or get an exam once a year at most. Only 20% of patients in the European countries visit the dental practitioner in case of emergency, while in Romania their percentage is 40%.

3. Conclusions and discussions

From this analysis we can draw two directions, namely:

1. Most of the respondents who have had root fillings following carious processes, also declare a frequent consumption of sweets and carbonated beverages, plus the preference for eating soft foods, which prevents the self-cleaning of the teeth. Hence, we conclude that there is a high risk of developing dental caries for them.
2. Lack of interest in dental hygiene and aesthetic appearance. Although a large number of respondents said they were brushing their teeth correctly, twice a day, there are enough situations when tooth brushing is performed once a day or less. Also, a significant number of subjects do not know the additional means of hygiene (mouthwash, dental floss, oral irrigation, etc.). Specialized

information is usually obtained from advertising materials and internet sources that do not always present the most accurate data. The frequency of visiting specialist doctor is quite rare and usually only when the pain occurs and not for preventive purposes.

In an effort to reduce the health gap of the Romanian population compared to the other EU countries, the National Centre for Health Assessment and Promotion, the National Institute of Public Health, the Ministry of Health and the World Health Organization have developed a series of campaigns to promote oral health. First of all, on the occasion of the World Oral Health Day on March 20th, various posters and brochures about the individual behaviour towards their own dental health were printed and distributed. During these campaigns, some information was provided on the proper technique for dental brushing. A set of educational materials that can be used by teachers in the classroom was developed. Some posters to inform children about good dental care practices were similarly designed for schools. There were printed leaflets addressed to pregnant women because it is well known that special attention should be paid to dental hygiene during pregnancy, for the cariogenicity is increased due to the decrease of mineral resources of the body. In addition, during this period, gingivitis often occurs due to hormonal changes. Therefore, the leaflets provide information to the future mother also on the care of the teeth in the newborn. Because they have great importance, these campaigns must continue and address all age groups.

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