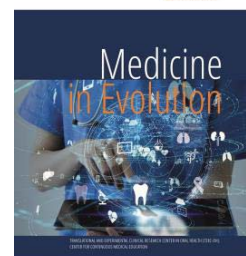


The Prevalence of Dental Erosion in Young Adults – A Quantitative Approach



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Abstract

Nowadays, dental aesthetics is of particular importance. The shape, colour and appearance of teeth are a very important criterion for inclusion in society. From their aesthetic to their masticatory function, teeth are indispensable to us in both natural and artificial form. Tooth wear is a term that refers to the loss of dental hard tissue because of mechanical or chemical processes not involving bacteria. Individual dietary habits may be the most important factor affecting dental structures through the erosive potential of acidic foods. The methodology used a quantitative approach for the study of the conditions that could lead to dental erosion in young adults. The instrument used was a questionnaire distributed online.

Keywords: eating habits, quantitative assessment, dental erosion

INTRODUCTION

Nowadays, dental aesthetics are of particular importance. The shape, colour and appearance of teeth are a very important criterion for inclusion in society. From their aesthetic to their masticatory function, teeth are indispensable to us in both natural and artificial form [1].

Tooth wear is a term that refers to the loss of dental hard tissue because of mechanical or chemical processes not involving bacteria [2]. Wear caused by normal masticatory function is considered a natural phenomenon. It can also be regarded as an adaptive and compensatory mechanism [3]. Our need to feed ourselves as well as the variety of foods available, exerts a load on the dental structure leading to inevitable wear of the teeth. Dental erosion is a type of wear caused by the action of acids not involving bacteria [4].

Globally, it is estimated that the prevalence of dental erosion is present in about 30% of people aged 9 to 19. In Europe, the percentage of young people with dental erosion ranges from 18% to 64%. These values vary widely because there is no standardisation and horizontal and vertical development of research on this issue, different clinical indices are mixed and the teeth examined are not always specified [5].

Individual dietary habits may be the most important factor affecting the erosive potential of acidic foods. Frequent consumption of citrus fruits could significantly increase the risk of dental erosion. Individuals with a high-fruit diet may also have higher frequencies of dental erosion [6].

According to the literature, the states with the highest level of erosion in children are the UK with 59.7%. High percentages are also found in Saudi Arabia with 95% and Sudan with 66.95%. It should be noted that the top countries in terms of percentage of dental erosion are countries with a high standard of living such as the UK or Saudi Arabia [7,8]. At the opposite pole, are countries such as Brazil with 26% and Turkey with 28%. At older ages, 18-34, there is a decrease in dental erosion, but at similar rates [9].

Studies conducted on the military in Saudi Arabia, on populations aged 18-34 years, showed dental erosion in 77% of the cases [10]. Another study, conducted in Switzerland on adults between 26 and 30 years of age, showed the presence of dental erosion in almost the entire population [11].

Aim and objectives

The motivation for conducting this research is due to the increasing prevalence of dental erosion internationally, despite prophylactic measures, an increase that is not yet fully explained. The aim of this study is to investigate the frequency of dental erosion as a function of lifestyle, dietary habits and other related diseases in young adults in Romania.

For this research, three objectives and three hypotheses were set for testing, in support of which the questions included in the questionnaire were established. The first objective concerns the collection of information on dental erosion in adults aged 18-34 years. The second objective aims to identify the conditions experienced by adults between 18 and 34 years old according to their eating habits. The third objective aims to identify dental hygiene habits and employed prophylaxis measures.

Three hypotheses were also generated. The first hypothesis targets young adults who frequently consume fruits and juices, citrus fresh beverages and have a higher degree of dental erosion. The frequency of episodes of nausea and vomiting is directly proportional to dental erosion. The second hypothesis is related to the high frequency of dental erosion in relation to a diet involving frequent consumption of highly-acidic foods. The third hypothesis

is that young adults who visit the dentist twice or more a year for check-ups and prophylaxis have less dental disease and manifestations of erosion.

MATERIAL AND METHODS

The individuals who participated in this research were informed in writing about the conditions of participation in this study. Written consent was obtained from all of them after they were made aware of and understood the conditions and modalities of the study undertaken.

The methodology used a quantitative approach for the study of conditions that could lead to dental erosion in young adults. The instrument used was a questionnaire distributed online via Google Forms.

The sample size was calculated for a 95% probability of guaranteeing results and a maximum allowable error of 5%. A sample size of 348 respondents was required in order to fit this data.

Sampling was non-random on a voluntary basis. This type of sampling was based on the self-selection of units (i.e. respondents decide themselves whether or not to participate in the survey). The statistical analysis software SPSS 25 was used for testing the hypotheses.

The questionnaire was created in Google Forms and distributed online via e-mail and social media platforms (Facebook, Twitter and Instagram). The response collection period was between 30 March 2022 and 18 April 2022.

RESULTS AND DISCUSSIONS

The questionnaire collected responses nationwide. A total of 348 complete responses were achieved during this period. The demographic data collected for the questionnaire were age, gender, residence, education and income.

The age of the respondents was segmented into 5-year categories to facilitate the interpretation of the results, but also to make it easier to observe the behavioural patterns and conditions of the respondents by approximate age. Out of the 348 respondents, 46% were in the 30-34 age category, 24.4% in the 25-29 age category, 20.1% in the 20-24 age category and 9.5% in the 18-19 age category. The residence background data showed a distribution of 64.1% in the urban area and 35.9% in the rural area.

The highest level of education of each respondent was collected and the following distribution emerged: two people had a PhD (0.6%), 12.4% a Master's degree, 31.7% a university degree, 7.5% a post-secondary school degree and 42.5% only a high school degree at the time of the questionnaire.

Monthly income earned by respondents was the last variable collected in the demographic data category: 23.3% had incomes below 1300 lei, 25.9% had incomes between 1300-2000 lei, 22.7% had monthly incomes between 2000-3000 lei, 18.45 had incomes between 3000-5000 lei and 9.8% had monthly incomes above 5000 lei.

The questionnaire started with a general question about the importance each person attached to their dental health. The response options were designed using a scale from 1 to 5, where 1 corresponds to "not at all important" and 5 to "very important". Out of the 348 valid responses, only one respondent chose a rating of 1, stating that the health of their teeth is not at all important to them. A rating of 2 was chosen by three people, representing 0.9% of the sample, and a rating of 3 was selected by 2% of the sample. Significantly more responses were for a rating of 4 on the scale, with 14.1% of respondents choosing this value. Most responses were for a rating of 5 on the scale, with 82.85% of respondents stating that the health of their teeth is very important.

The second question in the questionnaire concerned the importance given to oral hygiene. A scale from 1 to 5 was used, similar to the first question, where 1 corresponds to a “very low importance” given to oral hygiene and 5 to a “very high importance” given to oral hygiene. For this question, by self-assessment, 0.6% of the respondents chose a rating of 1, 1.1% of them a rating of 2 and 12.4% of the respondents a rating of 3. More answers were for a rating of 4, with 35.9% of the answers and most respondents chose a rating of 5, corresponding to a maximum importance given to oral hygiene.

After these two questions, participants were asked how often they brushed their teeth. One person mentioned that they did not brush and nine others mentioned that they brushed 3-4 times a month, 5.2% said they brushed 3-4 times a week, 42.25% said they brushed once a day, and most responses were for the option of brushing at least twice a day, with 49.7% of responses.

The next question in the survey asked about the frequency of flossing. The majority of respondents, 57.2%, said they did not floss at all, 8.3% said they flossed 3-4 times a month, 5.4% said they flossed approximately 3-4 times a week, 12.6% responded that they flossed once a day and 5.7% said they flossed at least twice a day.

The frequency of using mouthwash for oral hygiene was also investigated through the questionnaire. Thus, out of 348 valid responses, the majority, 39.7%, indicated that they did not use mouthwash, 11.2% said they used it 3-4 times a month, 11.5% said they used it 3-4 times a week, 25.9% of respondents said they used the mouthwash once a day and 11.85%, at least twice a day.

Afterwards, the participants in the online survey were asked how often they went to the dentist for check-ups, hygiene and scaling: 43.1% of respondents said that they only went to the dentist when absolutely necessary, 7.8% said that they went for check-ups once every 2 years, 26.7% said that they went to the dentist once a year, 14.4% went twice a year and 8% went 3-4 times a year for check-ups and hygiene.

The next item on the questionnaire was a series of statements to which respondents were instructed to respond if it matched their situation by choosing between two options – true or false (Table 1).

Table 1. Number of responses to statements

Statements	True	False
I only use fluoride toothpaste.	64	184
I use oral hygiene products recommended by my dentist.	129	219
I choose oral hygiene products by brand.	179	169
I use oral hygiene products according to the desired results.	289	59
I change my toothbrush every 3 months.	276	72
I use an electric toothbrush.	120	228

The consumption of some foods was investigated with the following questionnaire item. The aim was to find out how often foods were consumed that are known to cause dental erosion and oro-dental diseases. The foods listed were fizzy juices, energy drinks, coffee, wine, fresh fruit juices, sweets, fresh fruits. Response options for frequency were as follows: no consumption, 3-4 times a month, 3-4 times a week, once a day and twice a day.

Fizzy juices were rarely consumed or not at all, with only 22 people saying they consumed them once a day and 26 at least twice a day. Energy drinks were even less consumed by young adults, with no responses for twice a day consumption, and only 3 responses for once a day consumption. Coffee was more commonly consumed, with only 78 respondents saying they did not consume at all, and 44 saying they drank coffee at least twice a day. Wine was not consumed by the majority of respondents, about 60%, and 108 of them

said that they drank it 3-4 times a month. Only 18 said they drank wine 3-4 times a week, and none once or twice a day.

Regarding the oral health-related conditions, 10.9% said they suffered from gastro-oesophageal reflux disease, 12.9% said they suffered from bruxism, 1.1% said they suffered from bulimia and 0.6% said they suffered from anorexia, while 23.3% said they did not suffer from any of these conditions.

Another question was asked in the questionnaire to establish whether there are episodes of nausea and vomiting among young adults and more specifically how often they occur. There were 345 responses to this question, as it was marked as optional for response. Thus, 71.3% of the respondents said that they did not experience episodes of nausea and vomiting at all, 20.6% said that they experienced them rarely, 3.2% said that they experienced them monthly and 4.9% of the respondents said that they experienced them weekly.

Regarding tooth wear, study participants were asked to self-assess and choose the appropriate situation related to worn appearance and reduced tooth surface. When asked this question, the majority of the survey participants (65.8%) indicated that their dentition did not show any worn or reduced tooth surface area. Out of the remaining respondents, 14.5% mentioned that their front teeth were affected, 7.5% mentioned that their posterior teeth were affected and 12.2% mentioned that all of their teeth were affected.

Another issue leading to dental erosion is the consumption of carbonated drinks, but using a straw for these drinks manages to reduce their impact on the teeth. When asked if they used a straw for drinking carbonated drinks, 8.1% said yes, 42.3% said no and 49.6% said they used it occasionally.

Another item in the questionnaire was a multiple-choice question that asked respondents to self-assess whether these situations are applicable to them. Thus, 25.2% said they had transparent tooth edges, 50% said they noticed thinning and yellowing of their teeth, and 51.5% said they had increased tooth sensitivity. 13.6% said they had rough and irregular tooth edges, and 20.9% said they had stains or excavations on the surface of their teeth.

The last question in the questionnaire asked about areas of the teeth that have lost tooth substance and that are more sensitive to hot or cold stimuli. The majority of the respondents, 39.2%, said that they did not experience any sensitivity, 26.6% said that it occurred in a small number of teeth, 14.3% said that they experienced sensitivity in all the teeth and 10.5% said that it occurred only in the incisal edges.

RESEARCH LIMITATIONS

The disadvantage of the questionnaire distributed online was the voluntary participation aspect of the respondents. Most obviously, the gender distribution of respondents became very skewed, which may affect the representativeness of the questionnaire and the response rates to some questions. Out of the total number of respondents, 92% were female.

Respondents' self-assessment is a factor that involves the possibility of misjudging aspects of the actual oral health of the participants. Thus, we acknowledge that some conditions may have been underestimated or unknown to some of the respondents at the time of answering the questionnaire and that clinical examination would have provided much greater accuracy of these conditions.

COMPARISON OF DENTAL EROSION IN ROMANIA WITH OTHER COUNTRIES

From the data collected from the questionnaire it can be seen that the aspect of wear and reduction of the dental surface was mentioned by a total of 34.2% out of the 348 respondents. Considering that we are talking about self-assessment, we incline to believe that the early stages of tooth wear were neglected by the participants in the questionnaire and that

it is possible, that at least a percentage of the respondents were not aware of tooth wear until it reached advanced stages.

On another item in the questionnaire, the responses revealed that a total of 51.5% of people said that they had dental sensitivity, half of them said that they felt a thinning of the teeth, some said that they had teeth with transparent edges and a smaller percentage said that they had rough and irregular tooth edges. Given that this item allowed for multiple responses, we can conclude that at least 51.5% of respondents showed some form of tooth wear. We tend to believe that for many respondents there was no clear causality between tooth sensitivity and loss of dental hard tissue, transparent or irregular incisal edges.

Therefore, we set a minimum percentage of dental erosion based on the answers about dental erosion given to the two questions, i.e. 51.5%, estimated as an average result from the self-assessment of young adults.

In Sweden, in 18- and 19-year-olds, the prevalence of erosive wear of dentin among young people was observed in 22.3% of those clinically evaluated [12]. It should be noted that in this study, the low percentage is due to the investigation of dentin erosion and not enamel. Compared to the results of our study, this percentage may seem lower, but in our case, dental erosion was not categorized in enamel erosion and dentin erosion, because the assessment was performed subjectively through the self-assessment of each participant. In Norway, 38% of the 18-year-olds investigated had dental erosion in 2013 [12].

Finally, we can conclude that economically developed countries show a higher degree of dental erosion, and according to age, erosion is most advanced among children, it decreases in young adults, and probably continues to increase with advancing age [13]. The 51.5% prevalence of dental erosion estimated from the research undertaken for this paper is higher than in some countries and lower than in others. This is due both to the limitations of our own study and to the limitations of studies conducted in other states, where particular research situations (erosion by tooth type, enamel or dentin, etc.) may make the results not directly comparable.

VERIFICATION OF OBJECTIVES

The questions in the questionnaire were used to meet the three objectives and to test the three hypotheses established at the beginning of the research. The three objectives, gathering information on dental wear in adults aged 18-34, observing the conditions experienced by adults aged 18-34 in relation to dietary habits, and observing dental hygiene and prophylaxis habits, were met through the responses gathered from the questionnaire.

After achieving these objectives, data generated by Google Forms in an Excel spreadsheet was used to statistically analyse whether correlations existed, and whether they were statistically significant, between the demographics and the type and degree of dental erosion of the respondents. The Pearson correlation coefficient, denoted by r and p -value was used as a comparative indicator of the 0.05 threshold set for α to verify the probability that in the study population, the correlations found actually exist. The coefficient $\alpha=0.05$ means that a correlation found with this value will exist in the studied population with 95% probability, or that this correlation did not occur randomly in the study.

For the interpretation of the results, we took as reference a scale with which the strength of the results obtained were correlated. Thus, the values range from 1 to -1, which means that we can have a positive or directly proportional correlation between variables, or a negative or inversely proportional relationship between variables. Regarding the size of the coefficient, depending on its value between -1 and 1, the following powers were considered for the given absolute values: $r = 0$ - no correlation, $r = [0.01, 0.09]$ - negligible correlation, $r = [0.10, 0.29]$ - low correlation, $r = [0.30, 0.49]$ - moderate correlation, $r = [0.50, 0.69]$ - strong correlation, $r = [0.70, 0.99]$ - very strong correlation and $r = 1$ - perfect correlation.

In Table 2 it can be seen that there was no correlation between the age of the respondents and the importance attached to the health of their teeth. Similarly, age had no correlation with the frequency of going to the dentist for check-ups and hygiene.

Table 2. Demographic data correlations

		Age	Gender	Environment/ Residence	Importance of dental health	Frequency of dental check-ups
Age	Pearson Correlation	1	-0.011	0.139**	-0.009	-0.037
	Sig. (2-tailed)		0.837	0.009	0.866	0.495
	N		348	348	348	348
Gender	Pearson Correlation		1	-0.111*	0.114*	-0.014
	Sig. (2-tailed)			0.038	0.033	0.798
	N			348	348	348
Environment/Residence	Pearson Correlation			1	0.008	0.020
	Sig. (2-tailed)				0.886	0.706
	N				348	348
Importance of dental health	Pearson Correlation				1	0.161**
	Sig. (2-tailed)					0.003
	N					348
Frequency of dental check-ups	Pearson Correlation					1
	Sig. (2-tailed)					
	N					

* Correlation is significant at the 0.05 level (2-tailed);

** Correlation is significant at the 0.01 level (2-tailed)

The gender of the respondents was correlated to a small extent with the importance given to teeth health with a Pearson coefficient $r=0.114$ and $p=0.033$, which showed that this low correlation, was a positive and statistically significant one. From the interpretation of this result, we deduced that female respondents attached slightly more importance to dental health.

Respondents' residential environment did not correlate with the importance they placed on dental health. Similarly, the frequency of visits for check-ups did not correlate with the residence environment. Therefore, from these data, we deduced that in both rural and urban areas, there was a similar frequency of hygiene and scaling for young adults in Romania.

In this section we also wanted to find out whether the education of young people and their income level influenced the importance given to oral hygiene (Table 3).

Table 3. Income and education correlations

		Income	Education	Frequency of dental check-ups	Importance of oral hygiene
Income	Pearson Correlation	1	0.321**	0.095	0.099
	Sig. (2-tailed)		0.000	0.077	0.066
	N		348	348	348
Education	Pearson Correlation		1	0.134*	0.150**
	Sig. (2-tailed)			0.013	0.005
	N			348	348
Frequency of dental check-ups	Pearson Correlation			1	0.246**
	Sig. (2-tailed)				0.000
	N				348
Importance of oral hygiene	Pearson Correlation				1
	Sig. (2-tailed)				
	N				

* Correlation is significant at the 0.05 level (2-tailed);

** Correlation is significant at the 0.01 level (2-tailed)

The income of 18–34-year-olds did not influence the frequency of dental visits or the importance of oral hygiene. In this sense we concluded that regardless of income, young people went to the dentist with the same frequency. In addition, for those of younger ages, with lower incomes, we could consider that their monthly income was still supplemented by their parents' income and that, from this point of view, for some of them, the level of income was irrelevant to the frequency with which they went to the dentist.

The education of the participants in the questionnaire had a small influence on the frequency of dental check-ups. The Pearson coefficient was $r=0.134$, and the $p=0.013$, below the 0.05 limit set, so we concluded that this correlation was statistically significant for the population studied. A similar correlation was observed between education completed and the importance given to oral hygiene, with $r=0.150$ and $p=0.005$, which validated this low correlation for the population studied.

Note that the frequency of going to the dentist was to a small extent correlated with the importance given to oral hygiene, with $r=0.246$ and $p=0.000$, which showed that this low correlation was valid for the whole population of young adults in Romania.

Hypothesis 1 – “Young adults who frequently consume fruits, citrus fruits and fresh citrus juices are more likely to have dental erosion. The frequency of episodes of nausea and vomiting is also directly proportional to dental erosion.” For this hypothesis, the frequency of consuming fruits, citrus fruits and fresh citrus juices was correlated with the responses given for worn appearance and/or reduced tooth surface area (Table 4).

Table 4. Correlations for Hypothesis 1

		Do your teeth look worn or have they reduced their surface area?	How often do you eat the following foods? [Citrus fruits and fresh citrus juices]	How often do you eat the following foods? [Fruits]	Do you have episodes of nausea and vomiting?
Do your teeth look worn or have they reduced their surface area?	Pearson Correlation Sig. (2-tailed) N	1	0.224* 0.043 345	0.208 0.051 345	0.311* 0.049 345
How often do you eat the following foods? [Citrus fruits and fresh citrus juices]	Pearson Correlation Sig. (2-tailed) N		1	0.357* 0.013 348	0.012** 0.005 348
How often do you eat the following foods? [Fruits]	Pearson Correlation Sig. (2-tailed) N			1	-0.004** 0.000 345
Do you have episodes of nausea and vomiting?	Pearson Correlation Sig. (2-tailed) N				1

* Correlation is significant at the 0.05 level (2-tailed);

** Correlation is significant at the 0.01 level (2-tailed)

Frequency of consumption of citrus fruits and fresh citrus juices showed a low and positive correlation with the presence of dental erosions ($r=0.224$ and $p=0.043$). Frequency of fruit consumption in general showed no statistically significant correlation for the studied population. The frequency with which episodes of nausea and vomiting occur is positive and moderate ($r=0.311$ and $p=0.049$). Therefore hypothesis 1 was partially confirmed.

Hypothesis 2 – “Young adults who have a diet involving frequent consumption of high-acid foods have a higher frequency of occurrence of dental erosion.” For this hypothesis we selected responses on frequency of consumption of acidic juices, energy drinks, coffee and sweets and associated them with the degree of tooth wear and tooth sensitivity (Table 5).

Thus, from Table 5 it appears that there was a positive and low to moderate correlation between tooth wear and frequency of consumption of fizzy drinks, a negligible correlation between tooth wear and consumption of energy drinks, and a negligible correlation between consumption of coffee and sweets and tooth wear.

Table 5. Correlations for Hypothesis 2

		Worn appearance or reduced tooth surface	Increased sensitivity	Frequency [Fizzy juices]	Frequency [Energy drinks]	Frequency [Coffee]	Frequency [Sweets]
Worn appearance or reduced tooth surface	Pearson Correlation	1	0.244**	0.326*	0.200*	0.173	0.360**
	Sig. (2-tailed)		0.000	0.019	0.044	0.074	0.007
	N		342	345	345	345	345
Increased sensitivity	Pearson Correlation		1	0.186*	0.016	0.183	0.222
	Sig. (2-tailed)			0.011	0.075	0.079	0.091
	N			342	342	342	342
Frequency [Fizzy juices]	Pearson Correlation			1	0.388**	0.103	0.288**
	Sig. (2-tailed)				0.000	0.056	0.000
	N				348	348	348
Frequency [Energy drinks]	Pearson Correlation				1	0.063	0.186**
	Sig. (2-tailed)					0.244	0.000
	N					348	348
Frequency [Coffee]	Pearson Correlation					1	0.050
	Sig. (2-tailed)						0.352
	N						348
Frequency [Sweets]	Pearson Correlation						1
	Sig. (2-tailed)						
	N						

* Correlation is significant at the 0.05 level (2-tailed);

** Correlation is significant at the 0.01 level (2-tailed).

Worn appearance or reduced tooth surface was in a low and positive correlation with increased tooth sensitivity ($r=0.244$ and $p=0.000$), in a moderate and positive correlation with consumption of fizzy drinks ($r=0.326$ and $p=0.019$), and in a low and positive correlation with the consumption of energy drinks ($r=0.200$ and $p=0.044$), while the results were statistically significant for the study population. Dental sensitivity was in a positive and low correlation with consumption of fizzy juices ($r=0.186$ and $p=0.011$), and the result was statistically significant. There was a low and positive correlation between the consumption of coffee and dental erosion, with a coefficient $r=0.173$, but the correlation was not statistically significant ($p=0.074$). Consumption of fizzy juices showed a positive and moderate correlation with the consumption of energy drinks ($r=0.388$ and $p=0.000$). Consumption of sweets showed a positive and moderate correlation with dental erosion ($r=0.360$ and $p=0.007$), low correlation with consumption of fizzy juices ($r=0.288$ and $p=0.000$) and low correlation with consumption of energy drinks ($r=0.186$ and $p=0.000$), the results being statistically significant for the studied population.

Dental erosion was in a positive and low or moderate positive correlation with increased tooth sensitivity, the consumption of carbonated drinks, energy drinks and sweets which shows that hypothesis 2 was also partially confirmed.

Hypothesis 3 - “Young adults who visit the dentist twice or more a year for check-ups and prophylaxis have less dental disease and manifestations of erosion.” After the statistical analysis with SPSS (Table 6), it was found that there was a negative but negligible correlation between tooth erosion and the frequency of going to the dentist for check-ups, and between tooth erosion and tooth sensitivity. These correlations were not statistically significant for the study population, therefore hypothesis 3 was refuted.

Table 6. Correlations for Hypothesis 3

		Frequency of dental check-ups.	Have your teeth become worn or reduced in surface area?	You have increased sensitivity and more tooth loss in the area?
Frequency of dental check-ups.	Pearson Correlation	1	-0.092	-0.042
	Sig. (2-tailed)		0.088	0.443
	N		345	342
Have your teeth become worn or reduced in surface area?	Pearson Correlation		1	0.244**
	Sig. (2-tailed)			0.000
	N			342
You have increased sensitivity and more tooth loss in the area?	Pearson Correlation			1
	Sig. (2-tailed)			
	N			

** Correlation is significant at the 0.01 level (2-tailed)

CONCLUSIONS

From the data obtained with the questionnaire, it can be seen that the prevalence of dental erosion in young adults in Romania exceeds 51.5%, which shows that Romania is approaching the European average prevalence of dental erosion.

The first hypothesis investigated, “Young adults who frequently consume fruit and fresh citrus juices show dental erosion more often. The frequency of episodes of nausea and vomiting is also directly proportional to dental erosion”, has been partially confirmed. High frequency of consumption of citrus fruits and fresh citrus juices was found to lead to a higher frequency of dental erosion. A positive correlation was also found between frequent episodes of nausea and vomiting (specific to patients with certain conditions such as gastro-oesophageal reflux disease, bulimia) and dental erosion.

The second hypothesis, “Young adults who have a diet that involves frequent consumption of highly-acidic foods have a higher frequency of dental erosion” was also confirmed, with the exception of coffee consumption which showed no statistically significant correlation with dental erosion.

The third hypothesis, “Young adults who visit the dentist twice or more a year for check-ups and prophylaxis have less dental disease and erosion” was refuted. No correlation was found between erosion or tooth sensitivity and frequency of dental visits.

Our study showed that in our country young adults were also affected by dental erosion, but this was not related to demographic characteristics, but to oral hygiene habits and especially to food consumption habits, confirming similar research in the literature.

REFERENCES

1. Thesleff I. Current understanding of the process of tooth formation: transfer from the laboratory to the clinic. *Aust Dent J*. 2014 Jun;59 Suppl 1:48-54.
2. Isaksson H, Birkhed D, Wendt LK, Alm A, Nilsson M, Koch G. Prevalence of dental erosion and association with lifestyle factors in Swedish 20-year olds. *Acta Odontol Scand*. 2014 Aug;72(6):448-57.
3. van 't Spijker A. *Tooth Wear prevalence and occlusal factors*. Enschede: Ipskamp Printing; 2019.
4. Tong HJ, Rudolf MC, Muyombwe T, Duggal MS, Balmer R. An investigation into the dental health of children with obesity: an analysis of dental erosion and caries status. *Eur Arch Paediatr Dent*. 2014 Jun;15(3):203-10.
5. Yadav S. A Study on Prevalence of Dental Attrition and its Relation to Factors of Age, Gender and to the Signs of TMJ Dysfunction. *J Indian Prosthodont Soc*. 2011 Jun;11(2):98-105.
6. Yan-Fang R. *Dental Erosion: Etiology, Diagnosis and Prevention*. A Peer-Reviewed Publication, 2011.
7. Wang P, Lin HC, Chen JH, Liang HY. The prevalence of dental erosion and associated risk factors in 12-13-year-old school children in Southern China. *BMC Public Health*. 2010 Aug;10:478.
8. Muller-Bolla M, Courson F, Smail-Faugeron V, Bernardin T, Lupi-Pégurier L. Dental erosion in French adolescents. *BMC Oral Health*. 2015 Nov;15:147.
9. Li H, Zou Y, Ding G. Dietary factors associated with dental erosion: a meta-analysis. *PLoS One*. 2012;7(8):e42626.
10. Min JH, Kwon HK, Kim BI. The addition of nano-sized hydroxyapatite to a sports drink to inhibit dental erosion: in vitro study using bovine enamel. *J Dent*. 2011 Sep;39(9):629-35.
11. Buzalaf MA, Magalhães AC, Wiegand A. Alternatives to fluoride in the prevention and treatment of dental erosion. *Monogr Oral Sci*. 2014;25:244-52.
12. Søvik JB, Tveit AB, Storesund T, Mulic A. Dental erosion: a widespread condition nowadays? A cross-sectional study among a group of adolescents in Norway. *Acta Odontol Scand*. 2014 Oct;72(7):523-9.
13. Coupal I, Sołtysiak A. Dental erosion in archaeological human remains: A critical review of literature and proposal of a differential diagnosis protocol. *Arch Oral Biol*. 2017 Dec;84:50-57.