

## ORAL HEALTH STATUS AND RELATED BEHAVIOR IN ADULTS FROM NORTH-EASTERN REGION OF ROMANIA

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ORAL HEALTH STATUS AND RELATED BEHAVIOR IN ADULTS FROM NORTH-EASTERN REGION OF ROMANIA (Abstract): Oral health represents a standard for the quality of life of the individual in a society. Good oral health allows an individual socio-economic integration as well as personal development to the maximum capacity, thus making him useful to society. The **aim** of the study was to evaluate the oral health status as well as the behavioral factors that influence this status in the adult population from the N-E region of Romania. **Material and methods:** The retrospective study data were gathered via questionnaires completed by 765 participants in the “Prophylaxis Caravan” annual event between March 2022 - April 2023. We collect demographic data, information about type of medical insurance they have, the monthly income, the type of dental office they visit, about oral hygiene habits (number of daily tooth brushings, toothbrush changing, frequency of dental check-ups) and oral health status using DMFT index and CPITN index. SPSS 26.0 was used for statistical analysis,  $p < 0.005$ . **Results:** 64.3% of the subjects brush their teeth more than once a day, and 75.8% change their toothbrush 1-3 times/per year. 35.8% go to the dentist “when needed”, 59.3% of subjects go for check-ups or treatment. DMFT = 11.4, consisting of DT= 2.38, MT=6.20 and the FT=2.49. **Conclusions:** The oral health of adults in the N-E region of Romania is influenced by an important carious experience, dental edentacy having an increased value. Health promoting behavior as well as monthly income are elements that influence the quality of oral health of the population. **Keywords:** DMFT, CPITN, ADULTS, N-E REGION OF ROMANIA.

Oral health represents a standard for the quality of life of the individual in society. Good oral health allows an individual socio-economic integration as well as personal development to the maximum capacity, thus making him useful to society. The presence of untreated oral diseases produces great pressure on society, affecting the functioning in normal parameters due to the

presence of pain, discomfort, deformity, and sometimes death (1). These problems can be readily avoided if patients seek dental treatment on time. Early diagnosis of oral disorders, as well as fast clinical treatments, are promoted by good oral health-seeking behavior (2).

In Romania, even though there were socioeconomic disparities across groups, oral

health in adults has improved in recent decades. This condition can be explained by inequalities in individual oral status, as well as the impact of social variables such as economic, environmental, and lifestyle factors (3).

A low socioeconomic and education level, in association with reduced access to dental services and poor oral hygiene behavior, will result in a higher frequency and severity of dental caries and periodontal disease (4-7). The studies carried out so far in the adult population in Romania indicate an increased prevalence of oral diseases, the prevalence of dental caries varying between 70-90% (8,9) and periodontal disease between 60-70%, values that can be compared with those of neighboring countries (10).

A study on the oral health of the population in the Member States of the European Union conducted in 2010 of the percentage that in Romania, a percentage of 30% of the population declared that they are all natural. Among those who no longer have all their natural teeth, 14% are partially or totally edentulous. 32% have difficulty chewing due to dental lesions, and approximately 16% have experienced dental or periodontal pain. 16% were embarrassed by the aesthetic appearance of their teeth - the first place in Europe, while 81% believe they can reach a dentist within 30 minutes from home or work if necessary. The results of a study carried out in Iasi in 2019 regarding the level of knowledge and skills regarding oral health, showed that 35% of the participants chose toothpaste with a whitening effect, and almost 25% considered the type of toothpaste teeth rather insignificant (11).

The socioeconomic and cultural factors associated with the level of knowledge and attitudes accumulated regarding oral health

have an impact on oral status. Thus, the aim of the study was to evaluate the oral health status as well as the behavioral factors that influence this status in the adult population from the N-E region of Romania.

### MATERIAL AND METHODS

After receiving clearance from the Ethics Committee of the University of Medicine and Pharmacy "Grigore T. Popa" Iasi, Romania (no.322/08.06.2023), this retrospective observational study was undertaken among adults from the N-E area of Romania. The information was gathered via questionnaires presented to participants in the "Prophylaxis Caravan" oral health screening annual event.

The following criteria were used to select participants: adults over the age of 18 from Romania's N-E region, who signed informed consent and completed the full questionnaire after receiving explanations about the study under the condition of anonymity. We utilized the calculation procedure with a confidence level of  $p = 95\%$  to an adult population of 3.7 million people (12), and the sample size was 385 adults (13). Because adults completed 765 of the total surveys completed at the previous activity, we chose all questionnaires completed by adults between March 2022-April 2023.

In addition to demographic questions (age, gender, residence, occupation), the questionnaire included questions about the type of medical insurance they have, their monthly income, the type of dental office they visit, and questions about oral hygiene habits (number of daily tooth brushings, toothbrush changing, frequency of dental check-ups).

The DMFT index was used to evaluate the oral health status, measured by adding

the number of decaying (DT) teeth, the number of missing (MT) teeth, and the number of filled (FT) teeth (D) (14).

To evaluate the periodontal status, we used the Community Periodontal Index of Treatment Needs (CPITN) as a method of screening that evaluates the presence or absence of periodontal pockets, calculus, and gingival bleeding. Scores from 0 to 4 are given for each tooth examined, and finally, the need for periodontal treatment is established according to the score obtained on each sextant (15).

SPSS Software Version 26.0 (SPSS® Inc., Chicago, IL, USA) was used to produce descriptive statistics and evaluate the data gathered. Frequency, percentages, averages, and standard deviations were used to show descriptive data. The most essential characteristics that can define person's attitudes about oral health are age, gender, occupation, monthly income, and the frequency of visits to the dentist. To assess the differences between variables, t

Student test was utilized. A multivariate regression analysis was performed to assess the predisposition for an affected oral health condition. A p-value of 0.05 or less was judged statistically significant.

## RESULTS

First table shows the analysis results regarding the study group's demographic data. Thus, of the total of 765 participants, 53.7% are female subjects, 81.6% come from the urban zone and 55% are unemployed (student, unemployed, retired). The average age was  $47.68 \pm 17.42$  years (min. 19 - max. 82 years) (tab. I).

Regarding the distribution by socio-economic 31.9% of participants have a high level, 49.7% a medium level, and 18.4% a low level. From a financial point of view, 63.5% of the participants have a monthly income > 501 €, and 64.2% are self-financed, followed by 35.8% of those who have state insurance. 78.8% of the participants frequent private clinics (tab. I).

TABLE I.  
Distribution (%) of subjects according to sociodemographic (N= 765).

		No.	%
<b>Age</b>	47.68±17.42 (min.19, max.82)		
<b>Sex</b>	Female	411	53.7
	Male	354	46.3
<b>Residence</b>	Urban	624	81.6
	Rural	252	18.4
<b>Occupation</b>	Employee	344	45
	Unemployed (student, unemployed, retired)	421	55
<b>Socio-economic level</b>	High level	244	31.9
	Medium level	380	49.7
	Low level	141	18.4
<b>Monthly income</b>	EUR <500	279	36.5
	EUR >501	486	63.5
<b>Payment for dental services</b>	State insurance	274	35.8
	Private insurance and self-funded	491	64.2
<b>Preferred dental clinic</b>	Private clinic	603	78.8
	State clinic	162	21.2

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The evaluated oral health habits indicate that 64.3% of the subjects brush their teeth more than once a day, and 75.8% change their toothbrush 1-3 times/per year. Regarding the number of visits to the den-

tist, 35.8% go to the dentist "when needed" and 34.1% "once a year". The reasons to visit a dentist were for 59.3% of check-ups or treatment and for 40.7% for dental emergencies (tab. II).

TABLE II.  
Oral health habits

		No.	%
<b>Oral hygiene habits</b>			
Number of brushing/days	1 toothbrushing /day	273	35.7
	>1 toothbrushing /day	492	64.3
Number of toothbrushes/years	1-3 times/year	580	75.8
	>3 times/year	185	24.2
Number of visits to the dentist/ year	Less than 1 year	43	5.6
	Once a year	261	34.1
	Once in 5 years	187	24.4
	When needed	274	35.8
Reasons to visit a dentist	Check-up or treatment	454	59.3
	Emergency	311	40.7

The evaluation of the dental status achieved by determining the DMFT index indicates an important carious experience, DMFT having an average value of 11.4, consisting of DT (decayed teeth)= 2.38, MT(missing teeth)=6.20 and the FT ( filled teeth) component=2.49. The increased value of the extracted teeth component is observed. In relation to certain socio-demographic variables, dental status is more affected in the case of male subjects (DMFT=12.16), in those with a low socio-economic level (DMFT=15.65), and in those unemployed (DMFT=12.68). The recorded differences were statistically significant for all evaluated variables (p=0.000) (tab. III).

In the case of the periodontal status evaluated through the CPITN index, the evaluation indicates an increased frequency of subjects presenting dental calculus, followed by those with superficial pockets (up to 5mm deep) and those with gingival

bleeding. The distribution of the results in relation to the socio-demographic variables shows that male subjects (25.7%), with a high socioeconomic level (26.6%), employed (31.1%) show increased values for the dental calculus, while female subjects (16.8%), with medium socio-economic level (16.1%), unemployed (21.9%) show increased values for superficial periodontal pockets. The recorded differences were statistically significant (p=0.000) (tab. III).

Certain sanogenic habits as well as income can influence the adult's oral status. Thus, those who brush their teeth once a day have higher DMFT values (13.67) compared to those who brush more than once a day, the difference being statistically significant (p=0.000). The same trend is recorded in the case of those who go to the doctor "when needed" (toothache) (12.42) but also in those who go to the doctor only once a year (11.82). Although monthly incomes >501 euros/month, the value of

the DMFT index was higher (11.64) compared to the value recorded in the case of those with incomes < 500 euros/month (9.99) (tab. IV).

TABLE III.  
Oral health status vs. gender, socioeconomic level and occupation

	Mean value	Gender		Socio-economic level			Occupation	
		Female	Male	High level	Medium level	Low level	Employee	Unemployed
<b>Odontal status</b>								
DT	2.38	2.14	2.65	2.00	2.31	3.21	2.44	2.32
MT	6.20	5.75	6.71	3.95	6.13	10.26	3.57	8.35
FT	2.49	2.22	2.49	2.61	2.47	2.32	3.02	2.06
DMFT	11.04	10.07	12.16	8.56	10.92	15.65	9.03	12.68
<i>p</i>		0.000**		0.000**			0.000**	
<b>Periodontal status - CPITN</b>								
Healthy	51.0%	47.9%	54.5%	54.1%	49.7%	48.9%	55.2%	47.5%
Bleeding	6.8%	8.5%	4.8%	9.0%	6.8%	2.8%	8.7%	5.2%
Calculus	23.5%	21.7%	25.7%	26.6%	23.4%	18.4%	31.1%	17.3%
Shallow pockets	14.0%	16.8%	10.7%	8.2%	16.1%	18.4%	4.4%	21.9%
Deep pockets	4.7%	5.1%	4.2%	2.0%	3.9%	11.3%	0.6%	8.1%
<i>p</i>		0.017*		0.000*			0.023*	

\*t student test, \*\*ANOVA test, statistically significant differences when  $p < 0.05$

TABLE IV.  
Factors related to oral health habits and dental service's frequency of utilization

	Odontal status				<i>P</i>
	DT	MT	FT	DMFT	
<i>Number of brushings/day</i>					0.000
1 toothbrush /day	3.07	7.89	2.79	13.67	
> 1 toothbrush/day	1.99	5.26	2.32	9.58	
<i>Number of visits to the dentist/ year</i>					0.000
less than once a year	3.30	4.28	2.33	9.91	
once a year	2.65	6.46	2.71	11.82	
twice a year	1.71	3.57	2.89	8.17	
when needed	2.42	8.05	2.03	12.42	
<i>Monthly income</i>					0.000
< 500 euro	1.52	6.76	1.72	9.99	
> 501 euro	2.87	5.88	2.93	11.64	

ANOVA test, Statistically significant differences when  $p < 0.05$

TABLE V.

Multivariate regression between gender, occupation, monthly income (independent variables), and dependent dental status and hygiene attitudes.

	B	Std. Error	Sig.	OR	95% Confidence Interval for Exp(B)	
					Lower Bound	Upper Bound
DMFT >10	.869	.215	.000			
[Gender=Male]	-.492	.161	.002	.611	.446	.838
[Occupation=employed]	-.759	.179	.000	.468	.329	.665
[Socio-economic level=high]	-.994	.238	.000	.370	.232	.590
[Socio-economic level=medium]	-.863	.208	.000	.422	.281	.635
[Monthly income=<500 euro]	-.634	.183	.001	.531	.371	.759

The multivariate logistic regression (table 5) shows us that in the case of the number of tooth brushings, male subjects have a 0.611 greater predisposition to have a DMFT>10 than female subjects ( $p = 0.002$ , OR = 0.611), the same positive trend being recorded and in the case of those employed ( $p = 0.000$ , OR = 0.468), those with high socio-economic level ( $p = 0.000$ , OR = 0.370) and medium ( $p = 0.000$ , OR = 0.422) as well as for those with monthly income <500 euros ( $p=0.001$ , OR=0.531).

### DISCUSSION

Oral health, which has become a serious public health issue in every country, regardless of the degree of development, is an indication of individuals' standard of life and education (16-18). Socioeconomic and cultural factors impact the oral health of Romanians, who, despite the assistance of the medical insurance system and an increased number of dentists, have poor oral health (19-23).

The aim of our study was to evaluate the oral health status and the behavioral

factors that influence this status in a group of adult patients from the N-E region of Romania. For this purpose, we analyzed the indicators of the oral status (dental, periodontal) and the behavioral factors that affect attitudes related to oral hygiene, visits to the dentist, reasons for going to the doctor or monthly income, factors that influence access to medical services

The analysis of the collected data showed us that more than half of the subjects brush their teeth more than once a day, change their toothbrush 1-3 times/per year and less than half of participants go to the dentist "when needed" or "once a year". The reasons to visit a dentist were for 59.3% of check-ups or treatment and for 40.7% of dental emergencies. This kind of behavior can explain the high carious experience, with a DMFT index having an average value of 11.4. The increased value of the extracted teeth component is observed. The dental status is more affected in the case of male subjects, those with a low socio-economic level, and unemployed. The mean DMF index in this study was

higher than in other previously studies (24-28).

In the case of the periodontal state, as measured by the CPITN index, the results show an increased incidence of participants with dental calculus, followed by those with superficial pockets (up to 5mm deep) and gingival bleeding. The distribution of the results in relation to socio-demographic variables reveals that male subjects with a high socioeconomic level who are employed have higher values for dental calculus, whereas female subjects with a medium socioeconomic level who are unemployed have higher values for superficial periodontal pockets. These findings vary from those of other research in which female respondents have superior periodontal health due to higher levels of dental care knowledge and attitudes (29, 30).

Certain sanogenic habits, as well as income level, can influence the adult's oral status (31-33). In our study those who brush their teeth once a day have higher DMFT values (13.67) compared to those who brush more than once a day. The same trend is recorded in the case of those who go to the doctor "when needed" (toothache) (12.42) but also in those who go to the doctor only once a year (11.82). The results are like those of the studies carried out so far (34-36).

The income level is linked to oral diseases and a poor quality of life in terms of oral health (38, 39). In our study, although monthly incomes >501 euros/month, the value of the DMFT index was higher (11.64) compared to the value recorded in the case of those with incomes <500 euros/month (9.99). The studies carried out so far support the fact that socioeconomic

factors might impact dental service use. In Romania, dental treatments are generally supplied in private dentist offices, and patients pay for treatment out of their own pockets and access to these services is influenced by many factors (40).

Inequalities in access to medical services are found in all countries of the world, the pattern is similar in all European countries. Improving access to medical services can be done through better education regarding oral health as well as financial support for dental treatments, with the stimulation of preventive attitudes related to oral health. Currently, the costs for oral health care amount to significant values because patients in Romania present themselves to the doctor at an advanced stage of the disease, which entails high treatment costs (41, 42).

## CONCLUSIONS

The results of our study show us that the oral health of adults in the N-E region of Romania is influenced by an important carious experience, dental edentulism having an increased value. Sanogenic behavior as well as monthly income are elements that influence the quality of oral health of the population.

## CONFLICT OF INTEREST AND FUNDING

The authors declare that there is no conflict of interest, and they received no specific funding regarding this scientific research.

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