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PERIODONTAL STATUS OF ACTIVE AGE POPULATION IN THE REPUBLIC OF BULGARIA

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Abstract

Periodontal health is an important component of oral health. Numerous studies prove the progressing nature of periodontal diseases and their dependence on a number of demographic and socio-economic factors.

The purpose of the study is to examine the periodontal status of the active age population in the Republic of Bulgaria and to define its dependence on social and demographic factors.

To accomplish the study goals epidemiological and survey cards were developed and approbated and epidemiological study was conducted, including clinical dental examination and anonymous survey among 416 Bulgarian citizens aged 18 to 65 years. The results were statistically analyzed to establish the dependencies between the periodontal status and socio-demographic factors.

Only 69 (16.59%) of the study subjects have no periodontal problems (CPI = 0) in all sextants, while all other patients have different degrees of periodontal disease. One can witness an increase of the periodontal disease incidence, proportional to the age of the patients, as well as its decrease with increasing the frequency of dental visits on behalf of the patients and their oral health self-assessment. Healthy periodontal tissues prevail in young patients and urban population. Gingival inflammation and calculus are prevalent among middle-aged people, rural population as well as in individuals of lower educational level. Periodontal pockets of varying depths are being registered

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mostly among the older people and the subjects with low and average income. Higher severity of the periodontal pathology is observed in individuals of lower educational levels and lower income.

These facts verify the conclusion about an inadequate state commitment as regards the dental health problems of the population, while bearing in mind that the treatment of periodontal conditions is not reimbursed by NHIF.

Key words: demographics, periodontal status, social factors

Introduction. Periodontal health is an important component of the overall oral health. According to a number of studies the periodontal diseases are of progressing character and tend to increase in severity with age advancement [1–3]. They get more common with age, being more frequent in males than in females and among people, living in villages [4]. The progression of periodontal lesions with age is manifested mostly by an increase in the number of missing teeth [5].

A number of periodontal status studies of the population in our country were conducted in the last 30 years, outlining the trend of increase of both the prevalence and severity of the periodontal diseases with the age of the patients and the necessity of improvement of the individual oral hygiene [6–12].

The purpose of this study is to examine the periodontal status of the active age population in the Republic of Bulgaria and to define its dependence on social and demographic factors.

Material and method. To accomplish the study goals epidemiological and survey cards were developed and approbated and epidemiological study was conducted, including clinical dental examination and anonymous survey among 416 Bulgarian citizens aged 18 to 65 years from six regions in the country – Sofia, Plovdiv, Veliko Tarnovo, Burgas, Vratsa and Yambol. The study was compliant with the ethical standards and was approved by KENIMUS of the Medical University of Sofia. Study data were processed using the statistical software packages "R" and "SPSS" to establish dependencies between the demographic and socio-economic factors and the periodontal status of the patients.

Results. Examining the periodontal status of 416 patients no periodontal problems in all sextants (CPI = 0) were found in only 69 of the subjects (16.59%), while all other patients had different degrees of periodontal disease. In the different sextants of the dentition the highest percentage of healthy periodontal tissues (CPI=0) is present in second sextant (13–23) – 67.79%. Presence of calculus (CPI = 2) is registered most often in fifth sextant – 47.36%. Periodontal pockets up to 4–5 mm (CPI=3) are most often seen in third sextant – 8.41%, while such over 5 mm (CPI=4) are most frequently found in fifth sextant – 3.13% (Table 1).

Increase of the incidence of periodontal conditions proportional to the age of the patients is clearly witnessed. For the individuals in the age group of 18–29 years it amounts to 65.6%, for the patients aged 30–44 years the incidence is 87.4%, and for the people in the age group of 45–65 it is 91.03%. Periodontal diseases affect 83.8% of the ones living in towns and 79.3% of those living in villages. These

Table 1

Periodontal status

Sextant		Periodontal index (CPI)					
		0	1	2	3	4	X
First	Number (n)	177	146	35	33	7	18
	Percent	42.55%	35.1%	8.41%	7.93%	1.68%	4.33%
Second	Number (n)	282	99	18	7	5	5
	Percent	67.79%	23.8%	4.33%	1.68%	1.2%	1.2%
Third	Number (n)	176	154	33	35	5	13
	Percent	42.31%	37.02%	7.93%	8.41%	1.2%	3.13%
Fourth	Number (n)	165	162	40	31	7	11
	Percent	39.66%	38.94%	9.62%	7.45%	1.68%	2.64%
Fifth	Number (n)	100	89	197	12	13	5
	Percent	24.04%	21.39%	47.36%	2.89%	31.25%	1.2%
Sixth	Number (n)	165	168	36	30	6	11
	Percent	39.66%	40.38%	8.65%	7.21%	1.44%	2.64%

conditions are present in 84.8% of the individuals having higher education and in 82.1% of those of lower educational level. The highest incidence is observed in the '2000–2500 BGN' income group – 94.59%, followed by the '1000–1500 BGN' income group – 86.2% (Table 2).

Increase of the incidence of periodontal diseases proportional to the worsening of the dental health self-assessment by the patients is also established. Among people, defining it as "excellent" the prevalence is 55.8%, while for those, defining it as "poor", this rate is significantly higher – 97.5%. The prevalence of the periodontal conditions decrease proportionally to the increase of frequency of dental visits on behalf of the patients. For the subjects, visiting the dental office each six months the prevalence is 74.2%, while for those, who visit the dentist only in case of experiencing some pain and need of treatment, this rate is significantly higher – 95.66% (Table 2).

The dispersion analysis shows significant differences in the prevalence of the periodontal diseases depending on age, income, frequency of dental visits and dental health self-assessment by the patients ($p < 0.05$) and does not reveal such differences as regards residence and education of the patients ($p > 0.05$) (Table 2).

The highest percentage of healthy periodontal tissues cases (CPI=0) is found in subjects aged 18 to 29 years, among the urban population, as well as in individuals from the "no income" group and the group of low income – from 610 to 1500 BGN. In people with higher education the healthy periodontal tissues cases prevail in the upper jaw. While in patients with lower educational level they prevail in the lower jaw. The highest number of healthy periodontal tissues in all dentition sextants is present in the group, determining its dental health as "excellent", as

Table 2

Periodontal disease prevalence

	Prevalence of periodontal diseases	$\chi 2$ Criterion (Pearson's Chi-squared test of homogeneity)		
		$\chi 2$	df	p
Age				
18–29 years	65.6%	30	2	$2e^{-07}$
30–44 years	87.4%			
45–65 years	91.03%			
Residence				
Town	83.8%	0.1	1	0.7
Village	79.3%			
Education				
Higher educational level	84.8%	0.4	1	0.6
Lower level	82.1%			
Income				
None	57.1%	18	7	0.01
Up to 610 BGN	81.1%			
610–1000 BGN	83.1%			
1000–1500 BGN	86.2%			
1500–2000 BGN	85.7%			
2000–2500 BGN	94.59%			
2500–3000 BGN	84%			
Over 3000 BGN	83.3%			
Dental health self-assessment				
Excellent	55.8%	43	3	$3e^{-09}$
Good	82.2%			
Satisfactory	92.23%			
Poor	97.56%			
Frequency of dental checks				
6 months	74.2%	18	3	$5e^{-04}$
One year	81.2%			
Several years	89.4%			
When needed	95.66%			

well as among the individuals, visiting the dental office each six months (Table 3).

Gingival bleeding (CPI = 1) and calculus (CPI = 2) are registered predominantly in the age group of 30–44, among the rural population, the individuals of lower educational level, as well as in persons from the income group up to 610 BGN and the groups of average and high income – from 1500 to over 3000 BGN. Most cases of gingival bleeding and calculus are registered in the groups, self-assessing their dental health as "satisfactory" in fifth sextant and in the group

Table 3

Periodontal status dependencies on demographic and socio-economic characteristics of the patients

		Sextants					
		1	2	3	4	5	6
Age	p-value (Pearson's Chi-square)	$8e^{-09}$	$5e^{-04}$	$2e^{-07}$	$5e^{-07}$	$8e^{-04}$	$3e^{-07}$
	Correlation (Pearson's r)	0.24	0.18	0.19	0.19	0.15	0.22
	p	0	0.001	0	0	0.005	0
Residence	p-value (Pearson's Chi-square)	0.4	0.07	0.8	0.4	0.6	0.7
	Correlation (Pearson's r)	−0.05	0.01	−0.07	−0.02	−0.04	−0.05
	p	0.30	0.897	0.198	0.72	0.44	0.33
Education	p-value (Pearson's Chi-square)	0.1	0.3	0.3	0.5	0.8	0.05
	Correlation (Pearson's r)	0.03	0.03	0.04	0.04	0.04	0.04
	p	0.63	0.63	0.42	0.43	0.48	0.51
Income	p-value (Pearson's Chi-square)	0.03	0.3	0.3	0.1	0.3	0.06
	Correlation (Pearson's r)	−0.01	0.01	−0.001	0.05	0.05	0.05
	p	0.93	0.82	0.99	0.34	0.32	0.30
Dental health self-assessment	p-value (Pearson's Chi-square)	$1e^{-06}$	0.004	$2e^{-06}$	$1e^{-04}$	$5e^{-08}$	$5e^{-04}$
	Correlation (Pearson's r)	0.18	0.13	0.16	0.15	0.25	0.08
	p	0.001	0.014	0.002	0.003	0	0.15
Dental check incidence	p-value (Pearson's Chi-square)	0.002	0.008	$6e^{-05}$	0.002	0.004	$9e^{-04}$
	Correlation (Pearson's r)	0.18	0.19	0.22	0.20	0.21	0.19
	p	0.001	0	0	0	0	0

whose self-assessment is marked as "poor" in all other sextants, as well as in persons, visiting dental offices each several years in all sextants, except for the lower frontal segment, where the prevailing cases are registered in the group, visiting dental office only in case of complaints (Table 3).

Periodontal pockets (CPI = 3, 4) are seen predominantly in the age group of 45–65, in individuals with lower education and also in the groups of low and average income (up to 2000 BGN). They are prevalent in all sextants in patients, visiting a dental office only in case of pain, as well as in the groups with dental health self-assessment as "poor" in all sextants except first sextant, where the prevailing cases are in the group with "satisfactory" self-assessment (Table 3).

Data dispersion analysis shows significant differences in the breakdown of the periodontal status parameters of the patients in all sextants in the different

age groups, in second sextant depending on their place of residence as well as in first sextant depending on their income (Pearson's Chi-square, $p < 0.05$). High significance of the differences in the distribution of periodontal status parameters of the patients is found in all sextants in the different groups for "dental health self-assessment" and "examination frequency" parameters (Pearson's Chi-square, $p < 0.05$) (Table 3).

The correlation analysis proved poor positive statistically significant dependence between the variables of "age" and "periodontal status" for the second, third, fourth and fifth sextants ($p < 0.001$), while for first and sixth sextants the correlation is positive, moderate, statistically significant ($p < 0.001$), at controlling such characteristics as education, residence, income and frequency of dental office visits. This gives us ground to conclude that the periodontal status worsens with age, independent of all the remaining factors (Table 3).

The correlation analysis proved poor positive statistically significant dependence between such indicators as "dental health self-assessment" and "periodontal status" ($p < 0.05$) in all sextants except fifth one, at controlling such characteristics as age, education, residence, income, frequency of dental office visits (Table 3). As a result of all this we may come to a conclusion that the dental health self-assessment improves with the periodontal status improvement.

The correlation analysis proved poor positive statistically significant dependence between the "frequency of dental visits" and "periodontal status" ($p < 0.0001$), at controlling such characteristics as age, education, residence, income (Table 3). It gives us reasons to conclude that the more frequent dental checks are related to better periodontal status parameters.

Discussion. It is quite alarming that periodontal pathology of varying severity grade is present in 83.41% of all patients. Nonetheless the incidence of periodontal conditions reveals some decrease compared to previous studies [8,9].

The periodontal status of the patients worsens with age, while the more frequent dental office visits are associated with better periodontal status and better dental health self-assessment. This conclusion verifies the results from a study, conducted by Musurlieva and Stoykova [12].

Healthy periodontal tissues are most often registered in the upper jaw, predominantly in its frontal segment. The more severe pathology inflicts most often the lower frontal segment, and in this segment of the dentition also presence of calculus is most often established. Healthy periodontal tissues prevail among young patients and urban population. Gingival inflammation and calculus are prevalent in the middle-aged people, the rural population, as well as among the individuals of lower educational level. Periodontal pockets of various depth are registered predominantly among the oldest persons and those of low and average income. Increase of prevalence and severity of periodontal diseases is observed dependent on age, frequency of dental visits and dental health self-assessment.

Higher severity of the periodontal pathology is evident in those of lower education and lower income.

Conclusion. Periodontal pathology with various degrees of severity is witnessed in 83.41% of the patients. The more severe forms affect most often the lower frontal segment, and presence of calculus is also most frequently found in this dentition segment.

Significant differences are observed in the breakdown of the patients' periodontal status parameters dependent on age, frequency of dental visits and self-assessment of dental health. The periodontal status worsens with age advancement, as well as with rarer visits to the dental office, while it results in poorer dental health self-assessment on behalf of the patients and lower self-confidence.

These facts confirm the conclusion about an inadequate commitment of the state as regards the dental health problems of the population, while we have to take into consideration that the treatment of periodontal conditions is not reimbursed by NHIF.

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