Periodontal Health Knowledge Survey in a Group of Adults from Constanţa

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Abstract

The aims of this paper are to provide an overview of the periodontal disease risk factors in adults, to outline the importance of daily oral hygiene routine as part of prevention of periodontal disease and to evaluate the patient's experience in individual oral hygiene practices.

Methods. Study participants (n=896) were selected from adults that require dental treatment in faculty clinics. Subjects completed a questionnaire using structured written questions about personal oral hygiene practices and smoking.

The results show a higher distribution (52%) of young patients (<35 years) among the total group; the mean age of the study group is 40 years (standard deviation SD 18.2). High percentage, 40% (n=357) of the subjects reported that they currently smoke, 5% (n=43) reported that they quit smoking. Self-evaluation of oral hygiene showed that 25% of the subjects considered having excellent oral hygiene, 41% good oral hygiene, despite the high mean of plaque index in smokers - 1.34 (SD 0.69) and non-smokers -1.36 (SD 0.72). Young patients are using mainly dental floss (24% of category <35 years), as compared with 45-55 and over 55 years old, which are using mainly toothpicks. Toothbrushing time is decreasing in average as age group increases: 2.77 min. (SD 1.21) in <35 years, 2.67 min. (SD 1.21) in 35-44 years, 2.27 min. (SD 1.10) in 44-55 years, 1.76 min. (SD 1) in >55 years old. Electric toothbrushing is used in a higher percentage by young patients, <35 years group: 16% of non-smokers category, 30% of smokers category, 33% among quit smokers. Mouthwash is used in a higher percentage by non-smokers and by younger subjects.

Conclusion. Oral hygiene education needs to be improved in both smokers and non-smokers category, especially in older patients, who seem to be more careless with it.

Key words: *periodontitis, oral hygiene, smoking, plaque control*.

Background

The periodontal disease has an important social characteristic and its onset and evolution is related to the age, occupation, living standard, education, the frequency of dental monitoring (1).

In addition to the impact on the individual, there is a significant impact on healthcare resources needed to manage this condition (2).

The most important factor in the prophylaxis of periodontal disease is the control of the bacterial plaque deposition (3), which, by its development provides proper environment of the periodontal pathogen bacteria to colonize and grow (4) and to induce the periodontal inflammation and finally tooth loss (5,6).

The level of civilization and the technical progress allow new methods of plaque control to become available, being known that the bacterial plaque is the primary factor involved in the onset and evolution of the periodontal disease (1,7).

Aims

This study is motivated by the necessity of an accurate assessment of the periodontal health status of the adult population. The role of the daily oral hygiene in periodontal prevention, as well as maintenance after therapy must also be considered (8). In this respect, the study intended to

assess the attention of the patient regarding plaque control methods used, as important part of the complex periodontal therapy. The assessment was done in different age categories and results were compared according to the smoking habit of individuals.

Material and Methods

Study sample

The target population of the present study was adult population aged 18 years and older living in Constanta city. Subjects were clinically examined and answered uncomplicated questions regarding daily oral hygiene habits, as well as smoking habits.

The study sample was a convenience one and consisted of all new patients (n = 896) who met the inclusion criteria, agreed to participate and completed the questionnaire correctly. The study group comprised 406 (45%) males and 490 (55%) females. Subjects were divided according to age into the following groups: under 35 years old, 35-44 years old, 45-55 years old, over 55 years old.

Subject eligibility

Subjects qualifying for the study met the following inclusion criteria:

- over 18 years of age;
- more than 10 natural teeth;
- living in the metropolitan area of Constanţa.

Patients who did not complete correctly the questionnaire were excluded from the study.

The questionnaire included investigation of oral hygiene habits, smoking habits, subjective bleeding assessment, individual opinion about self-oral hygiene. The questionnaire was piloted on a group of 16 dental students and improvements were done.

In order to assess the reliability of the self-reported data, 20 patients from the study sample were re-interviewed a second time by the examiners. The second interview was made between two and five days after the first and no significant differences in the answers were noted.

Clinical examination

Plaque and calculus were assessed using the techniques for the Simplified Oral Hygiene Index (OHI) of Greene and Vermillon (1960, 1964). Both plaque and supra-gingival calculus were assessed on six selected surfaces (buccal surfaces of teeth 16, 26, 11, 31, and lingual surfaces of teeth 36, 46). If there was no first molar, the second molar was examined, if there was no central incisor, the lateral incisor was examined. The scores for the six surfaces were recorded, on specially prepared record charts, the plaque and calculus scores were added together and divided by six to give mean plaque and calculus indices. In order to obtain consistency, the examiners trained together before the study commenced and observed each other carrying our clinical examinations. However, no formal calibration was performed.

Ethics

The ethical committee of the Constanţa Faculty of Dental Medicine approved the study.

Patients who agreed to participate signed an informed consent form. At the end of the questionnaire, the participants were provided with oral health instructions and a specific periodontal treatment plan.

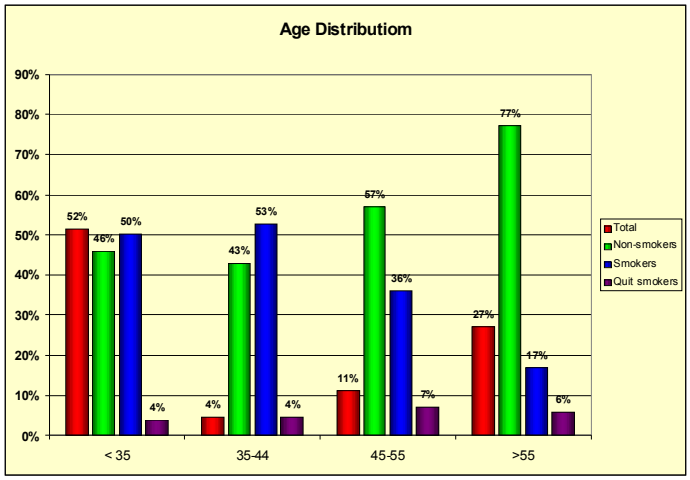
Data analysis

The distributions of the dependent variables expressing the plaque and calculus scores for both smokers and non-smokers were not normal. Statistical analysis was performed using non-parametric methods – Wilcoxon tests for unpaired observations (to test the correlation between PI, CI, toothbrushing frequency, toothbrushing time in smokers and non-smokers). Chi-square test was used to test if the variables have normal or non-normal distribution. Statistical significance was accepted at $P<0.05$.

Results

The age distribution of the study population is presented in *Figure 1*. The mean age of the study group was 40 years (SD 18), young adults under 35 years represented the majority of the study population (i.e. 52% of the total sample).

Figure 1. The age distribution of the study population



A percentage of 31% from the female group declare that they smoke (*Table 1*) and 50% from the male group are smoking as well.

Table 1. Smoking distribution according to sex

	Females		Males	
Total	490	55%	406	45%
Non-smokers	321	66%	175	43%
Smokers	152	31%	205	50%
Quit smokers	17	3%	26	7%

Toothbrushing self reported time has a lower average that the recommended one, 2.43 (1.13) minutes in total group, decreasing as age group increases (*Table 2*). Smokers seem to brush their teeth longer that non-smokers, 2.5 minutes in average compared with 2.39 minutes.

Table 2. Tooth-brushing time

Age (years)		**18-65**		**< 35**		**35-44**		**45-55**		**>55**	
		M	SD	M	SD	M	*SD*	M	SD	M	SD
Minutes	**Total**	2.43	1.13	2.77	1.01	2.67	1.21	2.27	1.10	1.76	1.00
	Non-smokers	2.39	1.18	2.83	1.05	2.92	1.33	2.51	1.08	1.74	0.97
	Smokers	2.50	1.06	2.70	0.97	2.48	1.09	2.00	1.12	1.82	1.12
	Quit smokers	2.37	1.20	3.00	1.08	2.50	1.29	1.83	0.75	1.86	1.17

Mouthwash is used only by 32% of subjects (*Table 3*). Highest percentage of mouth wash users (46%) was recorded in young patients < 35 and lowest percentage (9%) in the last age group >55. Non-smokers from each age group seem to use it more than smokers, as assessed on each age category.

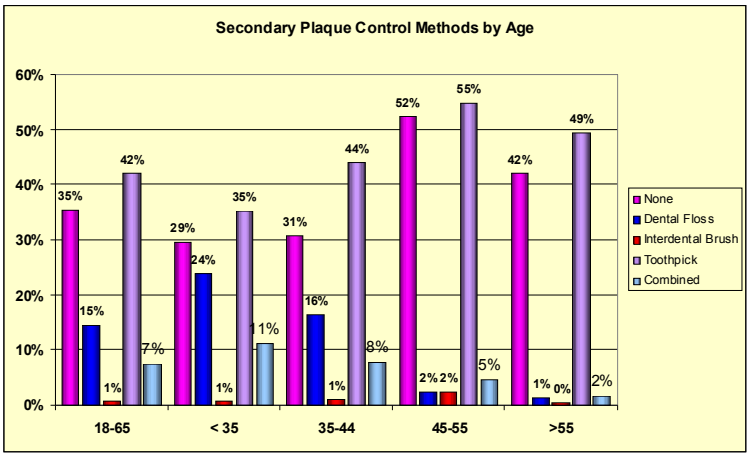
Table 3. Use of antiseptic mouthwash

Age (years)		18-65			< 35		
Sample	Total	284	895	32%	212	462	46%
	Non-smokers	152	495	31%	106	212	50%
	Smokers	122	357	34%	99	232	43%
	Quit smokers	10	43	23%	7	18	39%

Age (years)		35-44			45-55			>55		
Sample	Total	25	91	27%	26	100	26%	21	243	9%
	Non-smokers	14	39	36%	16	57	28%	16	188	9%
	Smokers	10	48	21%	8	36	22%	5	41	12%
	Quit smokers	1	4	25%	2	7	29%	0	14	0%

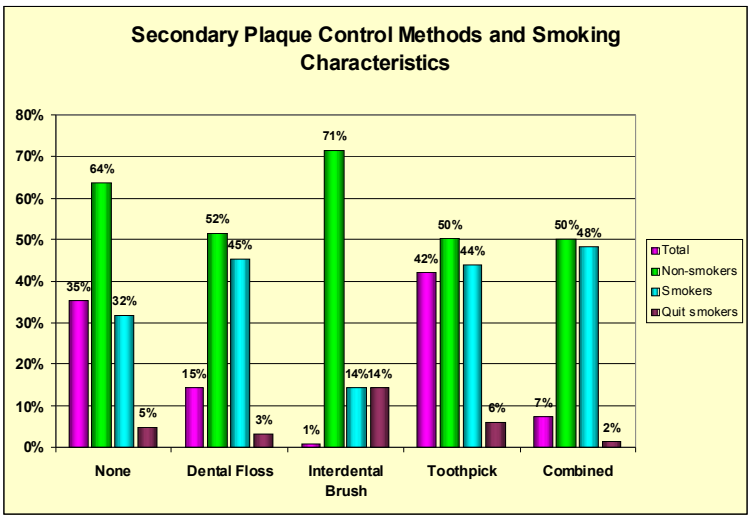
Dental floss is used only by a low percentage of patients (15%), most of them use toothpicks (42%) and 35% do not use any secondary method. It is observed that young patients mainly use dental floss (24% of <35 years), age groups 45-55 and over 55 are using mainly toothpicks: 55%, respectively 49% of each age category (*Figure 2*).

Figure 2. Use of secondary plaque control methods



Among subjects who do not use any secondary method of plaque control, 64% are non-smokers and 32% smokers (*Figure 3*).

Figure 3. Secondary plaque control methods by smoking



Electric toothbrush is used by 14% of the study population. Again, younger adults are using this method in a higher percentage than older subjects: 24% from the <35 years age group (*Table 4*). 22% of the smokers group and 9% of the non-smokers group use electric toothbrush as main plaque-control method.

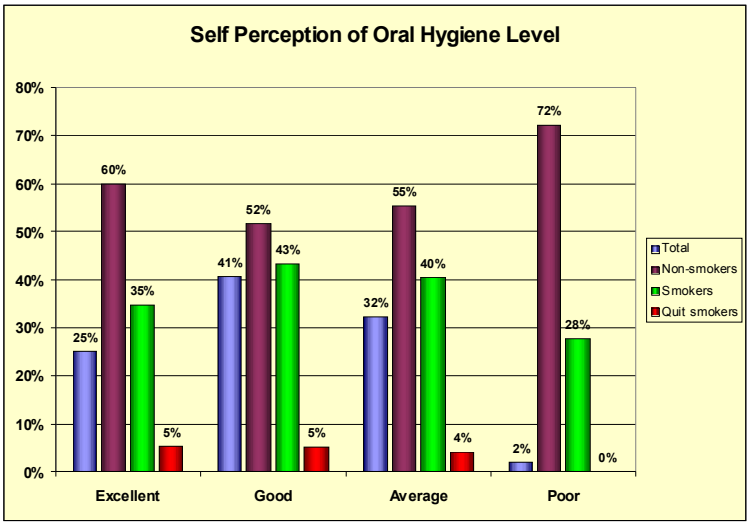
Table 4. Use of electric toothbrushing

Age (years)		18-65			< 35		
Sample	Total	129	894	14%	110	461	24%
	Non-smokers	45	495	9%	34	212	16%
	Smokers	77	356	22%	70	231	30%
	Quit smokers	7	43	16%	6	18	33%

Age (years)		35-44			45-55			>55		
Sample	Total	10	91	11%	5	100	5%	4	243	2%
	Non-smokers	3	39	8%	5	57	9%	3	188	2%
	Smokers	6	48	13%	0	36	0%	1	41	2%
	Quit smokers	1	4	25%	0	7	0%	0	14	0%

Subjects were asked to appreciate their current oral hygiene status from the moment of completing the questionnaire. Most of the subjects, 41% consider they have good oral hygiene, 32% average and 25% excellent (*Figure 4*). Positive correlation was found between the objective evaluation of oral hygiene level by OHI and subjective self-perception of the patients (Spearman correlation), r = 0.373, P<0.0001. Non-smokers seem to be more optimistic than smokers in self-perception of their oral hygiene level.

Figure 4. Self-perception of oral hygiene level



The overall mean value of plaque index assessed by the examiners (PI) was higher in smokers compared to non-smokers in age groups 35-44, 45-55 and >55. Positive correlation was found between smoking and plaque accumulation level P<0.0001 (Wilcoxon unpaired test).

The mean value of the PI increased with age in both smokers and non-smokers in all age categories, which might suggest that objective evaluation shows that young patients pay more attention to their oral hygiene than the older patients. Smokers seem to have higher plaque accumulations as compared to non-smokers on each age category.

Positive correlation between smoking and calculus accumulation level was found also P<0.0001 (Wilcoxon unpaired test).

The mean coefficients for the calculus index (CI) in the study population ranged between 0.9 (SD 0.71) in young adults under 35 years and 1.43 (SD 0.74) in >55 years age group. The mean

values for CI were higher in every age group of smokers compared to non-smokers, except young adults <35 years.

The overall differences in mean calculus accumulation were statistically significant between the overall group of smokers and the overall group of non-smokers: p=0.003 (Wilcoxon unpaired test).

Discussion

The WHO Oral Health Program contributes to the process of redressing the imbalance in the distribution of knowledge about oral health. As knowledge is a major vehicle for improving the health of people in particular, the WHO Oral Health Program focuses on stimulating oral health research to reduce risk factors and the burden of oral disease (9). According to Petersen (2005), more research should be devoted to the following items:

• Modifiable common risk factors to oral health and chronic disease, particularly the role of diet, nutrition and tobacco;
• Oral health – general health interrelationships;
• Psychosocial implication of oral health/illness and quality of life;
• Time-series data for oral health surveillance;
• Health systems research on reorientation of oral health services towards prevention and health promotion;
• Inequity in oral health and disease and the impact of socio-behavioral risk factors, and other public health programs (9).

In this respect, our study focused on the self-reported and objective assessment of oral health status of patients with periodontal pathology. This pathology includes plaque-induced gingivitis and chronic periodontitis.

Although some literature studies show the superiority of the electric toothbrushing especially in the interproximal areas (7), a small proportion of our study group (14 %) state that they have used the electric toothbrush. Younger adults <35 years are using this method in a higher percentage (24%) than older subjects: 11% in 35-44 years, 5% in 44-55 years, and only 2% of patients >55 years.

An unpleasant finding concerns the use of the secondary plaque control methods, which are applied by not so many patients as found in other studies (10). A proportion of 35% of the total number of patients do not use any secondary method. Among the secondary methods, the first place is occupied by toothpicks (42%), which are used without considering their indications and contraindications (interdental spaces occupied by the papilla). Dental floss, which is indicated for use by the majority of young patients included in the study group, is used only by a low proportion (15%) of subjects. Only 24% of adults <35 years declare using dental floss. One patient from 108 subjects over 55 years declare using interdental brushes and 1% of the total sample are using this secondary method. It is difficult to believe that so few have recession and exposed approximal areas.

The practical conclusion of those findings suggests the need of explaining the importance and purpose of using secondary methods for plaque control by all patients, including both gingivitis and other periodontal pathology, but adapting the type of the secondary device to each clinical situation.

A study done by ISRA Center Marketing Research (11) between april-june 2010 shows that 46.5% of Romanian population aged 18 years and over are smoking at least one cigarette daily. Men are smoking more than women, 59.2% of men are smoking at least one cigarette daily, compared to 34.5% of women, data which are similar to our data, which show that 40% of this adult population includes active smokers. In both age groups, <35 and 35-44 years, the percentage of smokers exceeds the non-smokers percentage: 50% (smokers) versus 46% (non-smokers), respectively 53% (smokers) versus 43% (non-smokers). In the oldest age group (over 55 years),

only a small proportion (17%) were current smokers. A 31% proportion of the females included in study are smoking and 50% of the males included in the study group are smokers as well.

These data indicate that the smokers group includes younger subjects than the non-smokers group. These data are of great concern, because smoking can affect the oral and systemic health condition of today young population, who in future will require considerable human and financial resources to manage their health problems. Those results may lead to the thought that it is important to organize efforts and support for youngsters to prevent them from starting smoking and to motivate them to quit smoking as soon as possible.

Smokers declare they have a more reduced tooth-brushing frequency and time comparing to the average of non-smokers in each age category. It could be speculated that smokers are more careless with the daily toothbrushing as compared to non-smokers in the studied subjects.

In all age groups (except >55 years) the mean of PI is higher in smokers as compared to non-smokers. CI has a higher average in all age groups in smokers' categories.

In previous clinical investigations more gingivitis, higher plaque index, higher calculus index and poorer oral hygiene have been observed among smokers (12,13). Other investigations have shown little difference in the level of plaque accumulation, while comparing smokers with non-smokers (14,15). In the present study a higher level of plaque and calculus accumulation, in smokers compared with non-smokers was observed in each age group.

The question regarding patient self-appreciation of its oral hygiene status revealed that most of the subjects, 41% consider having good oral hygiene, 32% average and 25% excellent. This question was introduced because several times we had the surprise that patients with a poor oral hygiene were reticent to the instructions given for the improvement of the oral hygiene measures, being sure that they maintain a good oral hygiene.

Comparing statistically the subjective and objective evaluation of the oral hygiene a good correlation was set, according to the Spearman's rank correlation coefficient $r = 0.373$, $P<0.0001$.

The concept of health has been the subject of intensified interest in past decades (16,17), where the dominating professional aspects have been questioned. In dentistry, Locker (18) has emphasized that if oral health is actively influenced, subjective perspectives need to be added to the objective clinical assessment. So, subjective self-reported information needs to be assessed by objective clinical diagnostic methods.

In the present study, the subjective, self-reported information should be evaluated carefully due to the limitations of the reliability of the questionnaire surveys. There is a need to enhance the knowledge of self-perception of oral and general health among our patients with periodontal pathology, developing healthy oral hygiene habits.

Conclusions

The conclusions of the study show positive connection between objective assessment and the subjective evaluation of oral hygiene status, oral hygiene depending directly on the correctitude of self-reported plaque control methods. High percentage of both males and females in this study group are smoking, oral hygiene needs to be improved in both smokers and non-smokers category, especially in older patients who show a more reduced concern for their oral hygiene. In this respect, smoking was associated with higher plaque and calculus deposits.

Clinical relevance: this study provides baseline information on oral health status in an adult population from Constanţa city, population that requires in the future improved education for oral hygiene methods, as part of the periodontal maintenance program.

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