ORIGINAL ARTICLE

ORAL HEALTH AND THE NEED FOR DENTAL CARE IN A GROUP OF PATIENTS FROM OLTENIA

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Abstract: (1) *Background*: Oral diseases are a major health burden in many countries and affect people throughout life, causing pain, discomfort, changes in facial physiognomy, and even death. The aim of the study was to determine dental treatment needs in a group of patients from Oltenia; (2) *Methods*: The retrospective study included 813 people, 341 men and 472 women, aged 6-93 years, presented for diagnosis and dental treatment between 2008-2018. The dental records of patients were used to evaluate the state of oral health, and the treatment needs of the patients. Data were collected and stratified into a database in Excel Windows (3) *Results*: Dental treatment needs included: oral health education sessions (33%), periodontal treatment (30.62%), fillings or other types of direct or indirect dental restorations (20.04%), including endodontic treatments, non-carious lesions treatment, extractions (27.42%), prosthetic restorations (71.83%), of which 10.08% complete dentures or overdentures with tooth or implant support and 43.9% partial dentures or bridges with tooth or implant support. (4) Conclusions: Social factors (socio-economic status and education of the population) and behavioral factors (diet and dental hygiene) have a great influence on dental health status.

Keywords: oral health, caries, non-carious lesions, edentulism, dental treatment needs

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1. Introduction

Health is defined in the WHO statement as the complete state of physical, mental and social well-being, which does exist only in the absence of disease or infirmity. Oral diseases are a major health burden in many countries and affect people throughout life, causing pain, discomfort, changes in facial physiognomy, and even death. These dental conditions share risk factors with other major chronic diseases [1]. Oral diseases are estimated to affect nearly 3.5 billion people [2].

Untreated dental caries in permanent teeth is the most common oral condition according to Global Burden of Disease 2017 [1]. More than 530 million children suffer from dental caries in temporary teeth. Severe periodontal disease, which can lead to tooth loss, is also very common, with nearly 10% of the global population affected. Oral cancer is one of the three most common types of cancer in some countries in Asia and the Pacific [3-9]. Most low- and middle-income countries are unable to provide services to prevent and treat oral health infections.

Factors that favor dental diseases are an unhealthy diet rich in sugar, tobacco use and excessive alcohol consumption. The uneven distribution of oral health professionals and the lack of adequate health facilities in most countries means that access to primary oral health services is often low. Overall, according to a survey of adults who express a need for oral health services, access ranges from 35% in low-income countries to 60% in lower-middle-income countries, 75% in upper-middle-income countries, and 82% in high-income countries [10]. Even in high-income settings, dental treatment is expensive, averaging 5% of total health expenditures [11].

In post-revolutionary Romania, many changes have occurred in the health system, and especially in dental care. Supported mostly by the state between 1965 and 1989, after 1990 most of the dental offices became private businesses, the offices in the clinics being concessioned to the dentists who worked in the clinics. On the other hand, a network of private offices has developed, in recent years many of them have turned into true polyclinics. This gradual change was accompanied by a decrease in the share of state support in the financing of dental care, with it returning almost 100% to the patient [12].

Also, the entire network of school and student dental offices, as well as dental offices dedicated to some companies, e.g. National Railways, underwent changes, their number gradually decreasing from one year to the next. Those who had the most to lose were children, who could no longer benefit from the prophylaxis programs carried out through these dental offices, as well as from free dental assistance. For quite a long time, there was also a lack of Pedodontics specialists, in recent years this specialty has been introduced and an attempt is being made to bring back the number of doctors dedicated to pediatric dental care. All this resulted in an

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increase in caries among children, evidenced by the increase in DMFT [12].

Children from the 90s became adults and the teeth affected by caries were lost, mostly generating lost teeth, which were not replaced in most patients.

Social factors represent a complex that contributes to the state of health through its behaviors: age, gender, socio-economic status. These behaviors are essential factors that influence health through the living and working conditions that people can aim for, or through the opportunity to choose a healthy lifestyle and medical services of good standards. There is a close relationship between educational and biological capital, studies show that the most educated people choose health services of very good quality. The level of education influences the life strategies developed by people to have a good life and good health, through a high level of information and knowledge about health and choosing a healthy lifestyle [13].

The socio-economic factors with a large impact on the health of the population in Romania are:

- poverty level
- unemployment rate
- social exclusion
- the structure of household expenses.

In 2019, Romania had GDP / capita in euros (Figure 1) that was equivalent to 70% of the European average according to Eurostat [14]. Also, Romania allocates only a small part of its GDP to health, and very little is allocated to dentistry, 0.33% of the single national health social insurance fund in 2020, the social insurance system allowing dental assistance with a financial cap for doctors are under contract with Romanian National Security Services, so very few patients can benefit from free dental treatments [15].

Four of the country's eight regions (Figure no. 2), North-East (44%), South-Muntenia, South-West Oltenia (54%), and South-East (58%) are below the 60% threshold from the EU average. Bucharest region, which is in Macroregion three, has already exceeded the European average with an impressive result (160% of the EU average) [14].

The purpose of the study was to assess the dental treatment needs in a group of patients who presented themselves for diagnosis and dental treatment in the period 2008-2018 in the Oral Rehabilitation Clinic of the Faculty of Dental Medicine in Craiova. The retrospective study also aimed to evaluate the patients' attitude towards oral health and dental hygiene, as well as the main factors that influence oral health status, including, among others, dietary practices and the frequency of tooth brushing.

Secondary objectives of the study were to find:

- patients presented for diagnosis and treatment in the Clinic for Oral Rehabilitation in the period 2008-2018;

- demographic characteristics of the study group;

- prevalence of systemic chronic diseases in the study group;

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- prevalence of oral diseases such as: caries, tooth wear, periodontal disease, edentulism;

- dental treatment needs necessary to solve the oral diseases of the patients in the studied group.

2. Materials and method

The retrospective study was carried out in the City of Craiova, Dolj County, at the Faculty of Dental Medicine of University of Medicine and Farmacy of Craiova on the group of patients presented for diagnosis and dental treatment in the Oral Rehabilitation clinic between 2008-2018.

For the retrospective, analytical study, the dental records of patients from the Oral Rehabilitation Discipline, used by teaching staff, resident doctors and students to assess the state of oral health and the treatment needs of the examined persons, were analyzed. The data from the dental charts were collected and stratified into a database in Excel Windows.

The research activities were carried out in accordance with the existing legislation in force and in compliance with the methodological norms of the research. Prior to this research, all patients were informed about their state of dental health.

Each patient presented in the Clinic signed also an informed consent for the processing of personal data and their use in clinical and epidemiological studies. Each patient was informed about the procedures used in the clinic and their informed consent was obtained.

Data related to several aspects were taken from the files in the archive:

- demographic data,
- data related to vicious habits,
- data related to associated systemic diseases, drug treatments,
- the socio-economic status (low, medium, high) was assessed by registering the profession,
- data related to the state of oral health.

Data from the dental charts were processed and an observation file was created for each examined patient.

Statistical analysis was performed with IBM SPSS Statistics v26 and Microsoft Excel for basic data analysis. The data were structured so that the need for dental treatment could be calculated for the group of patients studied, this being assessed according to the oral conditions present. The level of education and economic status was different for each individual patient, considering that they were selected from several localities within Dolj County.

3. Results

Of the 813 patients studied, 472 were women, representing 58.1%, and 341 were men, representing 41.9% (Table 1).

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Table 1. Demographic data of the study group.

	No	(%)
F	472	58.1
M	341	41.9
Rural	118	14.5
Urban	695	85.5
6-17	31	3.81
18-35	538	66.17
36-65	190	23.37
66+	54	6.64
Smoker	520	64
Non-smoker	293	36
Alcohol	105	12.92
Non alcohol	708	87.08
Total	813	100.0

The patients age ranged from 6 years to 93 years. Depending on the age group, most patients belonged to the age category 18-35 years (66.17%), followed by the age category 36-65 years (23.37%), the age category 66+ (6 .67%) and the 6-17 age group (3.81%). Depending on the place of residence, most patients came from the urban environment, 695 (85.5%), and from the rural environment 118 (14.5%) (Figure 1).

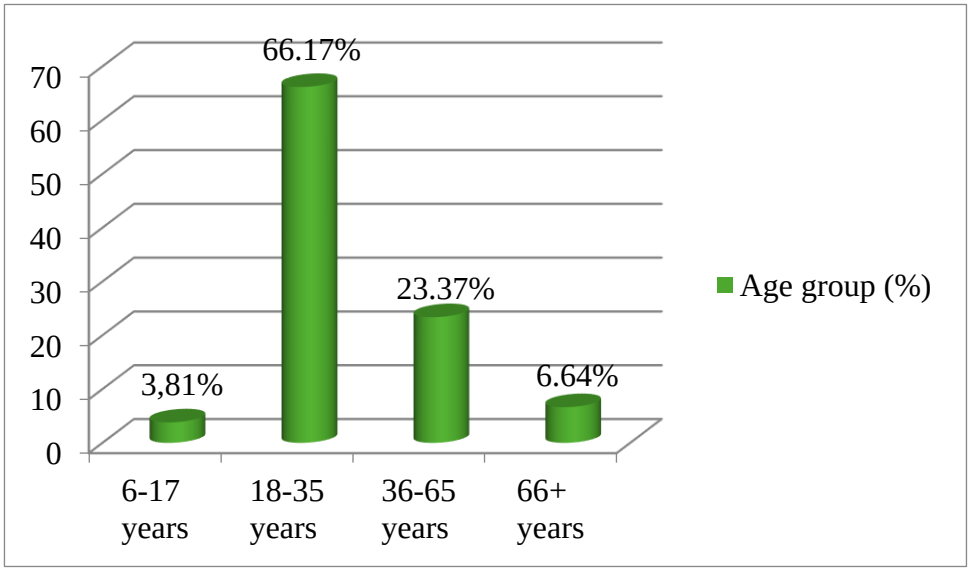

Figure 1. Distribution of patients according to age

By place of work, 39.5% were students, 30.11% were employed, 12.41% were retired, 7.01% were unemployed, 6.33% were pupils, 3% self-employed, and 1.73% own a business (Figure 2).

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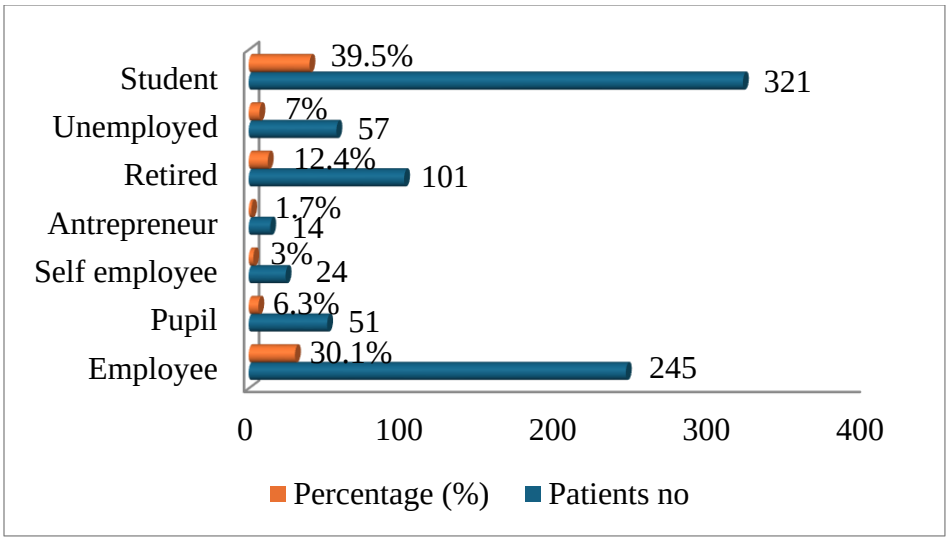

Figure 2. Distribution of patients according to employment status

Of the 813 patients interviewed, 520 reported being non-smokers (64%) and 293 reported being smokers (36%). Regarding tooth brushing habits, 67% of patients brushed twice a day, 14% only once a day, of which 5% in the evening and 9% in the morning, and 19% of patients brushed their teeth occasionally.

Table 3. frequency of visits to the dental office and periodic check-ups.

	No	(%)
Tooth brushing		
Once a day	113	14
Twice a day	545	67
Occasionally	155	19
Visit to the dentist		
Periodic check-up	147	18.08
Treatments	211	25.95
Emergencies	455	55.96

Speaking about the frequency of visits to the dental office and periodic check-ups, only 18% of patients go to the periodic check-up once every 6 months, 26% go to the dentist only, when necessary for treatment, and 56% go only in case of emergencies, for pain. (Table 3).

Regarding the frequency of systemic diseases, out of 813 patients, 273 (33.57%) suffer from at least one disease or condition. Among them, 76 people suffer from a single disease or condition, representing 27.84% of the total number of patients who declared that they have a condition or disease and 9.35% of the total number of patients, 73 people

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suffer from two diseases or conditions, representing 26.74% of all patients who declared that they suffer from one disease or condition and 8.97% of all patients, and 124 people suffer from three or more diseases or conditions, representing 45.42% of all patients who have a disease or condition and 15.25% of all patients (Figure 3).

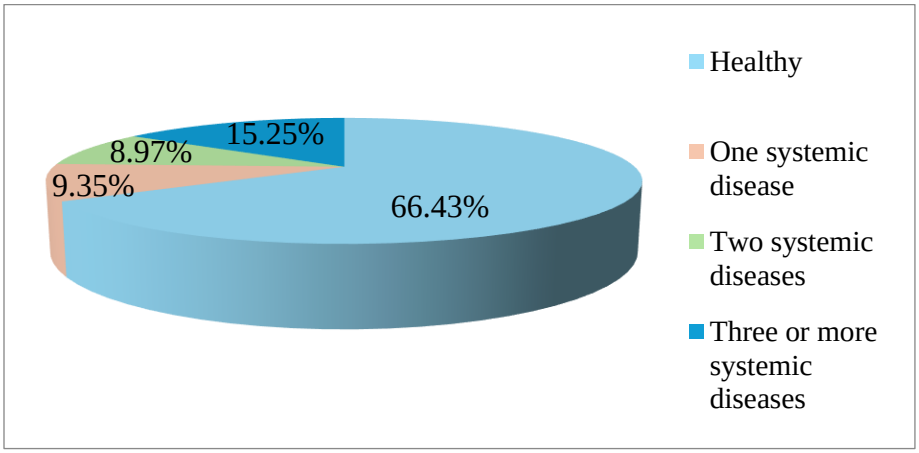

Figure 3. Distribution according to systemic health status

From the total of 273 patients who declared that they suffer from one or more ailments or diseases, representing 33.57% of the total number of patients surveyed, most declared that they suffer from hypertension (28.93%), allergies (13.55%), anemia (13.18%), sinusitis (10.62%), sleep disorders (8.42%) and type II diabetes (7.69%). From the 813 patients included in the study, 249 suffered from periodontal disease (30.62%). 129 (15.87%) of them had gingivitis in various stages of evolution, and 120 (14.76%) suffered from periodontitis in various stages of evolution.

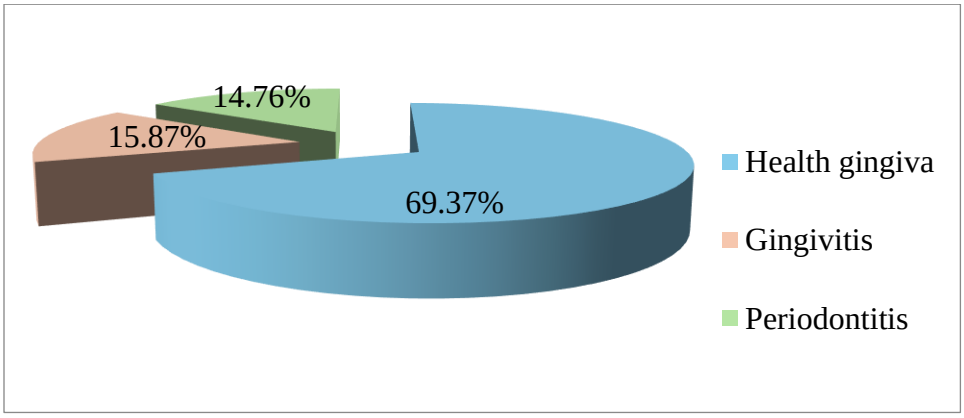

Figure 4. Distribution of the prevalence of periodontal diseases within the studied population

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Regarding edentulism, of the total of 813 patients, most of them 584 (71.83%) presented one or more classes of edentulism on one or both arches, as presented in table 5.

Most of the patients had class II edentulism (37.2%), followed by class IV edentulism, and other classes of edentulism (Table 5).

Table 5. Distribution of the prevalence of edentulism.

Kennedy edentulism class	no	(%)
Complete edentulism	27	3.32
Extended edentulism	55	6.76
Class I edentulism	56	6.88
Class II edentulism	301	37.02
Class III edentulism	5	0.61
Class IV edentulism	140	17.22

Almost half of the study participants (45.51%) had a carious dental condition in various stages of evolution. Among them, 14.76% had one or more teeth with simple caries, 5.28% had teeth with complicated caries, 14.76% of patients had teeth with complicated apical periodontitis, 12.66% of patients had unrestorable teeth, 1.10% had both simple and complicated caries, and 0.86% had complicated caries with complicated apical periodontitis (Table 6).

Table 6. Distribution of the prevalence of dental diseases.

	No of patients	(%)
Teeth lesions		
Simple caries	120	14.76
Complicated caries	43	5.28
Apical periodontitis	120	14.76
Extensive caries	103	12.66
Abrasion	12	22.64
Abfraction	3	5.66
Erosion	14	26.41
Attrition	16	30.19
Fractures	8	15.10

Estimation of the need for dental treatment was for a. Oral health education and correct brushing: 33% of patients (who brushed their teeth once a day or occasionally), b. Periodontal treatments (first stage periodontal treatment, which includes

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scaling, brushing, education for proper brushing adapted to the dentition, application of local anti-inflammatory substances, periodic checks for evaluation and maintenance): 30.62% of the patient group, c. Dental treatments of simple and complicated carious lesions: 20.04% of the patient group, d. Dental treatments of non-carious lesions: 6.51% of the patient group, e. Extractions of teeth with complicated apical periodontitis or unrestorable: 27.42% of the patient group, f. Prosthetic restorations – 71.83%. Total dentures or overdentures on teeth or implants – 10.08% of the patient group (patients with subtotal or total edentulism), partial dentures or bridges with teeth or implant support - 43.92% of the patient group (patients with terminal edentulism), dental bridges or bridges with teeth or implant support – 17.83% of the group of patients (patients with partial limited edentulism) (Figure 5).

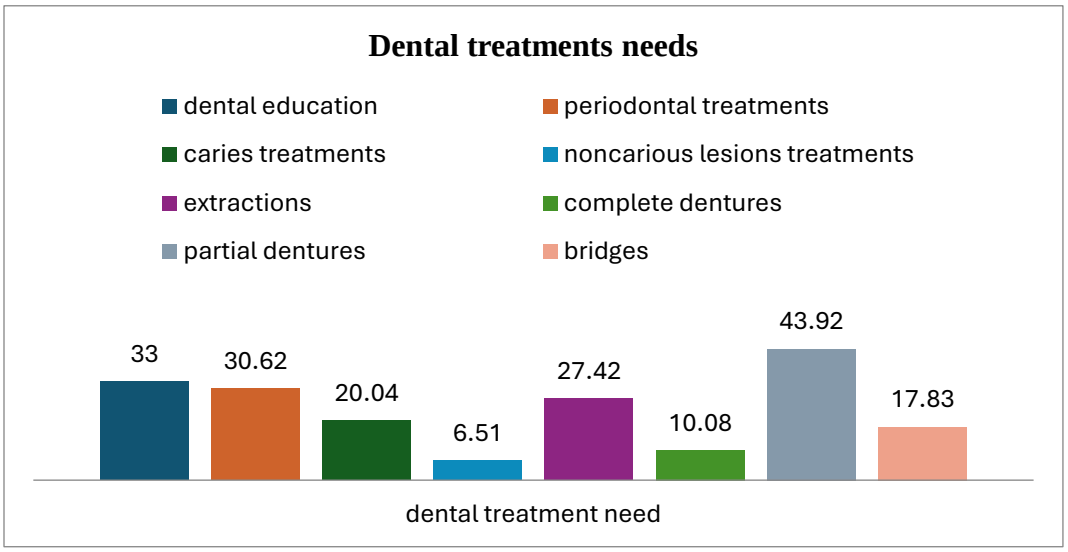

Figure 5. The need for dental treatment expressed as (%) patients.

4. Discussion

The group of patients included in the retrospective study is quite well represented, both in terms of gender distribution, 472 being women, representing 58.1% and 341 men, representing 41.9%, as well as in terms of age, including both children, from 6 years to 93 years old. Depending on the age group, most patients belonged to the age category 18-35 years (66.17%), followed by the age category 36-65 years (23.37%), the age category over 66 and between 6-17 age group being in minority. The clinic being in the city of Craiova, most patients came from the urban environment, patients from the rural environment, coming from the villages surrounding the city of Craiova.

Since the clinic has specific university dental assistance, a large part of the patients

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were students, a third had various professions, and a small part were retired, unemployed, pupils, self-employed, and owned a business. Most patients were non-smokers and most did not consume alcohol occasionally or daily.

Although they had a good perception related to oral health, the patients did not actually have a good oral health status. 67% of the 813 patients who completed the form declared that they brush their teeth 2 times a day, and 33% once daily or occasionally, and yet, the prevalence of dental diseases in the studied population is 45%, which can question the correctness of the patients' answers. Patients' perception of the need for dental treatment is always lower than the need for treatment estimated by the dentist, especially in the case of the elderly [16].

Results from another study of elderly Australian men showed that poorer oral health status with fewer remaining functional teeth was associated with patients' perception of needing some form of dental treatment; however, dental caries and the severity of marginal periodontitis were not associated with patients' perception of dental treatment needs related to major dental conditions: (i) edentulous, (ii) caries and (iii) periodontitis [16]. In other words, only patients with extensive or complete edentulism felt the need for dental treatment, while those with caries, periodontal disease or reduced edentulism were considered healthy and did not need dental treatment.

Such patient perceptions of the need for treatment lead to a reduced number of visits to the dentist for periodic check-ups, (in our study approximately 18%). Visits to the dentist are reserved for borderline situations when pain occurs (in majority), the patients' motivation being the financial situation and the difficult access to dental services, which is partially true, considering the increase in the number of dental offices in the last 30 years, which led at a ratio of 1 dentist per 1235 inhabitants, similar to countries like Belgium, Portugal. However, since the distribution of doctors and dental offices in urban areas is much higher than in rural areas (87.7% doctors in urban areas and 85.5% dental offices in urban areas) and the number of patients per doctor is much disproportionate, i.e. 1 doctor per 782 inhabitants in the urban environment versus 1 doctor per 3898 inhabitants in the rural environment in 2020 [17, 18].

Regarding disease frequency, almost a third of all patients suffered from at least one disease or condition. Among them, were people that suffered from only one disease or condition, representing a third of all patients who declared that they had one condition or disease, and almost 10% of all patients had two diseases or conditions, representing almost a quarter of all patients who declared that they suffer from a disease or condition, while people that had three or more diseases or conditions were representing almost half of all patients who have a disease or condition. The most frequent systemic diseases in the patients in the studied group were hypertension, allergies, anemia, sinusitis, sleep disorders and type II diabetes.

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In a 2017 study conducted on a group of patients from Iasi County, morbidity was dominated by cardiovascular diseases (63.24%), chronic digestive diseases (33.82%), diabetes (29.41%), diseases osteoarticular (27.94%), accidents and traumas (26.47%) and chronic respiratory diseases (23.53%); in the female sex, it was also dominated by cardiovascular diseases (67.82%), followed by diabetes (32.18%), osteoarticular diseases (31.03%) and chronic digestive diseases (24.14%) [19] .

It is interesting that in our study, of the 813 patients included in the study, only 249 patients, representing 30.62%, suffered from periodontal disease, while 33% declared that they brush daily but not once a day, or occasionally. Other studies have also found a similar effect, since in women from the north-eastern part of the country a prevalence of 41.33% of periodontal disease was found, with a much lower effect on the male sex [19].

Almost half of the study participants had a carious dental condition in various stages of evolution. Among them, only a small part had one or more teeth with simple caries, the majority had teeth with complicated caries, teeth with apical periodontitis, and unrestorable teeth. Compared to our study, a caries prevalence of 58.55% was observed in a group of patients from Iasi County, the percentages being almost equal in women (59.81%) and men (57.30%) [19].

From the total of 813 patients, only a small part had teeth suffering from non-carious dental conditions. In the group of patients from Iași County, the prevalence of non-carious oral diseases was much higher, 42.67% in women, men being particularly affected by traumatic injuries (24.24%) [19]. The most affected teeth were those in the frontal area because they are the most prone to accidents, trauma, bad habits, untimely brushing.

Regarding edentulism, most patients from the study group had one type of edentulism, one or more classes of edentulism on one or both arches, edentulism class II being most common, followed by class IV edentulism, and class I, extensive edentulism and complete edentulism. In the previously mentioned study carried out in a population from Iași County, a higher prevalence of complete edentulism was observed, namely 27.87% [19].

The estimation of the need for dental treatment was made for the studied group by referring to the percentage of patients affected by a certain type of oral disease. Thus, it was estimated that the 33% of the studied group who did not brush their teeth correctly needed oral health education sessions, the 30.62% with various periodontal diseases needed at least initial periodontal treatment, 20.04% had needs for fillings or other types of restorations, to which endodontic treatments were added, 6.51% needed the treatment of non-carious lesions with the establishment of periodic maintenance sessions, 27.42% of the patients needed extractions. Added to all this is the very high percentage of patients who needed prosthetic treatment – 71.83%, of which

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10.08% needed complete dentures or overdentures with teeth or implant support and 43.9% partial dentures or bridges with teeth or implant support.

The lack of information and health education is evident among the Romanian population, which requires the need to act in this regard. The retrospective study presented in this work supports this idea and brings new information related to the oral health of the population of our country. Comparing the current situation in our country with the current situation in other European countries, we see that there are major differences. The dental status of the populations in Europe, much more economically developed, is much better. Europeans are less affected by carious lesions and periodontal diseases, the number of extractions following these conditions is lower. This fact is reflected in the higher percentage of people with intact permanent dentition, without prosthetic works or extractions. At the same time, it is observed that European citizens are more conscientious in terms of oral hygiene and the vast majority go regularly for check-ups in the dental office. This difference between the situation of the Romanian population and other European citizens is explained by the fact that at the European level, larger funds are allocated for prophylaxis and health promotion, due to the higher economic level [20].

Another factor that contributes to this better situation of oral health is the legislation as well as the health education that in many European countries is already introduced in schools. Even if a series of promotion programs have been held in Romania in recent years, on World Oral Health Day, they were few and poorly publicized [20].

The main strategy for the primary prevention of carious lesions begins with training patients to improve their diet, reducing their consumption of sugar and high-sugar foods, and avoid eating sweets at several meals [21].

Also, speaking of the patients' habits in terms of oral care at home, they must do the best dental hygiene at home, at least twice a day, in the morning and in the evening after meals, improve the technique of tooth brushing and oral care time [22].

The new approach in caries management involves the early diagnosis of incipient lesions and the level of carious disease risk that the patient has and implementation of the primary prevention strategies. Caries risk indicators are limiting predictors of caries progression and future risk in the evolution of adult caries. The most important predictor of future dental caries is the history of carious disease as well as current caries activity [23].

5. Conclusions

The need for dental treatment in patients from the study group includes:

- oral health education sessions,
- periodontal treatment,
- dental fillings or other types of direct or indirect dental restorations, to which endodontic treatments are added,

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- non-carious lesions treatment with the establishment of periodic maintenance sessions,
- extractions,
- prosthetics restorations, that included the need for partial dentures or bridges and for a small part of the patients complete denture.

Social factors (socio-economic status and education of the population) and behavioral factors (diet and dental hygiene) have a great influence on dental health status.

It is necessary for dentists to include in their clinical practice evaluation of caries risk for each individual patient as a periodic examination protocol.

Dentists need more evidence-based approaches to caries risk assessment, diagnosis and prevention.

Preventive rather than restorative treatment should be the main strategy of the dental practitioner, including changing dietary habits and oral hygiene at home through educational programs.

Regarding the educational aspect, it is necessary to introduce health education into the school curriculum, because it must be started from an early age, so that in the future we get healthy and educated adults able to pass on this information to their children.

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Data availability at request.

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