COMPARATIVE STUDY OF ORAL HEALTH SYSTEMS IN EUROPE

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ABSTRACT:

The European health systems have developed starting from two different models, namely the Beveridge model and Bismark model, respectively, each of them having different funding and organization.
At its turn, the oral health system, as an integrating part of the national system, shows some characteristics and particularities favorable or not to the patients and professionals in this field.
The aim of this paper is to compare the oral health system of different European countries by means of the oral health indicators (DMFT at 12-year-olds, percentage of totally edentate people) and economic indicators (GDP percentage for health, dentists' annual average wages, and oral health expenses per inhabitant). Moreover, the study lays focus on the distribution of professionals in the selected European countries while comparing the official statistic data in terms of density of dentists, and the ratio between the number of medical technicians and assistants and the number of physicians.
The conclusion of the study shows that Romania occupies the last place in terms of GDP funding (0.3 %vs. 0.85% in Germany) and registers the highest value for DMFT index at 12-year-olds (2.4 versus 0.7 in Sweden and the Great Britain).
Despite all that, in Romania, the profession of a dentist is considered as sufficiently attractive, the proof being the indicator showing specialists' density for 100,000 inhabitants, namely 83.5 in Romania, a value that is close to the European Union mean -88/100,000 inhabitants.

Key words: oral health system, Europe,dentists, oral indicators

INTRODUCTION

Oral health as an integrating part of general health is a fundamental right of each individual and must be included both in the medical services provided to the population, and in the prevention and educational programmes. The World Health Organization defines the health system as "*all the organizations, institutions, resources and personnel whose primary purpose is to promote, restore and maintain health*" [1]. The health systems belong to the category of macro social determinants having a direct favorable or not impact on the activity of physicians and patients through the price of treatments, the basic medical coverage, accessibility and addressability [2].
As for the organization of European health systems, two models stand out, namely the *Beveridge* model (adopted by the United Kingdom of Great Britain and Sweden where the management of the system is carried out by a professional administration controlled

by the Parliament), and the *Bismark* model (adopted by Germany and Romania, where the system is not managed by the state, and medical care is established by contracts between the medical professions and the Health Funds) [3].The health systems must be accessible, efficient and capable to cope with the different pressures the society may encounter at a given moment [4]. This is the case of the current situation relating to COVID 19 pandemic, where the pressure determined by the large number of patients may lead to collapse [5].

In Europe there are not any perfect health systems, each country encountering specific as well as common issues such as the aging of population with consequences for the medical services, the higher and higher cost of medical technologies and treatments, the unequal distribution of specialists in the territory, and the high impact of chronic diseases [6,7].

In Romania, decision-makers' interest for the field of oral health is low, on one hand due to the deficient perception of importance of this domain, and due to the lack of a constant public pressure in this respect, on the other hand [7]. According to the same study, the issues existing in Romania refer to the lack of some uniform policies in the field of oral health, the lack of epidemiological surveys for the assessment of population's oral health, the insufficient funding and low involvement for the prevention and promotion of health [7].

The *aim* of our study is to make a comparison between the main oral health indicators in Romania and those of other countries such as France, Germany, Sweden, the Netherlands and Great Britain, in the light of some indicators assessing oral health and the provision of specialized services (funding, salaries, territorial distribution).

METHODS

A collection of published information sources was used as reference material for this paper: articles and official reports with detailed description of oral health care systems from each country [8-13]. We used articles and quantitative data from a number of different sources, including databases from the European Comission, Council of European Dentists, the Organization for Economic Cooperation and Development (OCDE), as well as data from national statistical offices [14-19].

The indicators that have been selected are:

-Average number of decayed, missing and filled teeth (DMFT) at age 12;

-Percentage of population with total edentation;

- Dentists/100.000 inhabitans and other dental work force;

-Estimated percentage of PIB spent on oral health;

- Average annual salary of the dentists;

- Dental care expenditure / inhabitant /per year.

RESULTS

1. The Romanian oral health system

The oral health system has known numerous changes in recent years, mainly after Romania has acceded to the European Union. In Romania, the Health Fund is managed uniformly at national level and divided into regional centers. The largest category of individuals is that if employees (36%), followed by retirees (24%), and students (22%). Among the advantages of the Romanian oral health system there are the free of charge treatments given to children and the 60% coverage of some dental treatments provided to adults. In exchange, disadvantages are more numerous:

-the minimum package of dentistry services is limited;

-the limited reimbursement by the Health Fund within the ceiling of 2000 lei (400 Euros)/ month/dentist;
-the high costs for prosthetic, implantology treatments and some esthetic treatments [20];
- the extremely low access to dental treatments of the persons in the rural environment where there is about 13% of the dentistry office;
-the lack of prevention programmes;
Moreover, the economic crisis started in 2008 has had negative repercussions on the activity of the medical sector, including the stomatological one, through the interruption of the contract with the Health Fund for several months [21].
In Romania there are not currently any national dental cavity prevention programmes for children but only some educational programmes carried out by some independent local organizations [22].

2.The oral health system in selective countries

2.1. Coverage for oral health care

The health systems differ from one country to another in terms of medical policy, the interest paid to it and the coverage level from the gross domestic product. Table 1 shows big differences between Romania and the other selected European countries, from a percentage of 11.3% in Germany to only 5.2% in Romania which occupies the last place [19]. As far as the oral health system is concerned, it may be seen that Romania allocates only 0.3% of GDP as compared to 0.85% in Germany (table 1) [16]. The same situation is also encountered in terms of the annual salary, namely in Romania dentists earn on average only a third of the salary earned by the dentists in the selected European countries (table1).

Table 1 Current health care expenditure relative to GDP, 2017

Country	Percentage of GDP for health	Percentage of GDP for oral health	Dental care expenditure / inhabitant /per year	Average annual salary
Germany	11.3%	0.85%	315€	38.735 €
France	11.3%	0.50%	161 €	33.897 €
Sweden	11%	0.68%	292€	36.222 €
Netherlands	10.1%	0.36%	385 €	78 061€
United Kingdom	9.6%	0.60%	157 €	34.817 €
Romania	5.2%	0.30%	-	11.000 €

Source: Eurostat, 2020; OCDE, 2015

As for the mandatory oral care basic insurance, one may see that:
-the population aged below 18 is covered by a free of charge insurance in France, Germany, Netherlands, and Sweden. In Romania there are curative treatments, such as for fixed orthodontic appliances which are not covered by the mandatory coverage.
-In **Germany** 56 % of the dental treatments are covered by the mandatory insurance, 27 % by the patient and 17 % by private insurance; Prosthetic treatments for adults are covered only for 50% , which may go up

to 65% in case of regular visits to the dental room

-In **Netherlands** only 26% is covered by the mandatory basic insurance, 19% by patients and 55% by private insurance. As for adults, only dental avulsion and movable prosthetic appliances are covered 100%.

-Founded on the principle of national insurance, the **Sweden** model is universal and covers all the people who live or have residence in this country. In Sweden each person receives 317 Euros/year for oral care. Moreover, social security insurances pay 50% if the treatment reaches 1584 Euros and 85% for higher amounts [23].

Dental insurance in the United Kingdom has 2 basic forms:

-fixed annual fee covering a series of treatments;

-fixed dental insurance where private insurances offer coverage only a certain level.

2.2.Oral health indicators

Oral health indicators analyzed in this study relate to DMFT at 12 year-olds and the percentage of adults with total edentation (table 2). Romania registers the highest value for DMFT (2.4) followed by France (1.2), Sweden, the United Kingdom (0.7) and Germany (0.5).

Most EU countries have an average DMFT index below 3.0 in 12 year old children. The nine countries that have the average DMFT index above 3.0 are Austria, Iceland, Germany, Greece, Israel, Spain, Yugoslavia, Hungary (4.3) and Poland (5.1)[24, 25].

The lack of prevalence studies at national level in Romania is highlighted by the fact that the values of indicators for oral disease prevalence are not known, such as the percentage of totally edentate persons. In other countries, this indicator varies from 40% in Netherlands to 6% in Sweden and the United Kingdom [14, 15, 26].

Table 2 Oral health indicators in selected European countries

	Average number of DMFT at age 12	% population with total edentation
ROMANIA	2.4	NA
FRANCE	1.2	16
GERMANY	0.5	12.4
NETHERLANDS	0.6	40
UNITED KINGDOM	0.7	6
SWEDEN	0.7	6

Source: CED 2015

2.3.Oral health professionals

In *Romania*, the number of oral health professionals was 16,262.000 in 2019, according to the statistic data provided by Eurostat, with a ratio of 83.5 dentists per 100,000 inhabitants (table 3) [17]. The distribution of the oral health professionals by counties in 2019 shows that the highest number of dentists was registered by the Municipality of Bucharest-3142, while the lowest number was registered by Giurgiu County-79. Their distribution was 87.6% in the urban environment and 12.4% in the rural environment [18]. According to the same sources, the number of dental offices was 15,542 in 2019, out of which 13,286 were located in the urban environment, and 2,256 in the rural environment[18].

France has 4,000 dentists for a population of 67,000.000 inhabitants which represents 65 dentists per 100,000 inhabitants. In

Germany, the number of dentists is 76,720, out of whom 87% carry out a liberal activity, with a density of 86 dentists per 100,000 inhabitants. In *Sweden* there are 7400 dentists, out of whom 47% carry out a liberal activity and 53% are employees of the public system, with a density of 78/100,000 inhabitants. Out of the 8600 active dentists of the *Netherlands*, 93% carry out a liberal activity and 7% are employees of the public system. In *United Kingdom*, the number of dentists is 37,049, with a density of 52.7. In many European countries there are also other categories of oral health professionals such as dental technicians and assistants, and the highest number exists in Germany, where there is a ratio of 2.6 per 1 dentist (table 3) [27]. According to official data, in some countries there are special categories of personnel, such as dental therapists, who carry out their activity only in the United Kingdom. They have limited attributions in terms of oral care and education for school children consisting only in making fillings and extractions of temporary teeth [28].

Table nr 3 Nr of dental health professionals in Europe (selected countries)

Country	Nr. dentists /100.000 inhabitans	Nr dental assistants/oral hygienists per dentist
France	64.7	0.5
Germany	85.8	2.6
Netherlands	55	2.2
United Kingdom	52.7	1.5
Sweden	81.3	1.8
Romania	83.5	-

Source **:** CED 2015

DISCUSSIONS

There are not anywhere “pure” systems with a single funding mechanism, but there is a predominant pattern coexisting with all other patterns in different proportions. It is difficult to assess health level in relation to expenditures made. A high GDP percentage allocated to dentistry reflects a high number of dentists activating in the respective country, but it does not necessarily mean better oral care, unless it has low values of indicators reflecting the oral care state.

According to the data provided by Eurostat, in 2019 in the European Union countries the average number of specialists was 88/ 100,000 inhabitants, with extreme values from 35.1 in Poland to 123.9 /100,000 inhabitants in Greece. Low density is encountered in countries such as the United Kingdom - 52.7, Slovakia - 51, Netherlands - 55 [17]. According to the same source, in Romania, the density of 83.5 dentists /100,000 inhabitants is close to the European mean, the problem being related to their unequal distribution in the territory.

As for the annual salary, there are large discrepancies between the European Union countries: the first place is occupied by the Netherlands where dentists working in the public sector have an annual salary of 78,061 Euros, while the European mean is 36,000 Euros. In Romania, the annual salary is only 11,000 Euros. Following the training of

auxiliary personnel working in the oral care system, dentists have the possibility to delegate a part of their responsibilities to the former such as the performance of dental X-rays, patient's education, periodontal scaling and other non-invasive operations. In Romania, there is not any database regarding the number of auxiliary personnel, but it is known that the number of dental hygienists is very low [17].

As for the basic insurance for adults, the most generous is Germany where 100% of treatments are covered within some low tariffs. Diametrically opposed is Netherlands where universal coverage is only for dental avulsions and removable dental prostheses, the rest of treatments being covered by the private insurances.

CONCLUSIONS

1. The lack of some national screening programmes in France and Romania is highlighted by the inexistence of a database on oral health as there is in Germany and Sweden.

2. DMFT for 12-year-olds has the highest values for Romanian children (2.4), while the lowest value is registered by Germany (0.5).

3.In France and Romania there are not any national programmes for oral prevention as there are in Germany, Sweden and Netherlands where these represent an essential common point.

4. The cost of dental treatments is high in Sweden and Netherlands, what makes the profession of a dentist to be very attractive in these countries while Germany and Romania are at the opposite pole. Moreover, in Romania the costs for implantology and prosthetic treatments cannot be paid by certain social categories.

5.The density of dentists varies a lot between the European Union countries from 35.1/100,000 inhabitants in Poland to 123.9 /100,000 inhabitants in Greece; only the United Kingdom has a special category of oral health professionals called dental therapists.

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