ISSN: 2573-8224

Research Article

Journal of Oral & Dental Health

Do Modern Dental Care Systems Meet Patients' Expectations - Selected Organizational Aspects of The Dental Care Sector in Poland On the Example of a Research Group of Dental Offices

Joanna Kobza, DDS, M.A., PhD*

Associate Professor, Head of Public Health Department, School of Public Health in Bytom, Medical University of Silesia in Katowice, Poland

***Corresponding Author**
Joanna Kobza, DDS, M.A., PhD, Associate Professor, Head of Public Health Department, School of Public Health in Bytom, Medical University of Silesia in Katowice, Poland.

Submitted: 2024, Oct 05; **Accepted:** 2024, Nov 20; **Published:** 2024, Nov 22

Citation: Kobza, J. (2024). Do Modern Dental Care Systems Meet Patients' Expectations - Selected Organizational Aspects of The Dental Care Sector in Poland On the Example of a Research Group of Dental Offices. *J Oral Dent Health, 8*(3), 01-08.

Abstract

Introduction: *Numerous studies of the oral health of Poles, indicate that dental care in Poland is very ineffective and requires significant organizational and financial changes.*

Objectives: *The main aim of the study was to analyze the performance of the dental care sector in Poland based on a study conducted among a group of dentists running dental*

Material and Methods: *The cross-sectional study covered 610 dental offices selected randomly. The study was carried out using the face-to-face interview technique, based on an original questionnaire. Statistical analyzes were carried out using the Shapiro-Wilk test. χ2 test, Mann-Whitney U test, Kruskal-Wallis test and Cramer's V coefficient, and Cochran-Armitage trend test. Statistical analyzes were performed in SAS 9.4. There was also a review of scientific literature and statistical data; national and international documents.*

Results: *The human resources of dentists in Poland are high, dentists are a highly feminized professional group, the average age is 46, the dominant form of conducting medical activity is individual medical practice, the majority of entities do not employ either a dental assistant or a hygienist. Dental offices are very well equipped, the latest technologies are used in the therapeutic process, doctors systematically improve their professional skills and willingly implement quality standards but the majority of respondents do not subscribe professional magazines and only 30% know what the term evidence-based dentistry means, dentists in majority are satisfied with their jobs.*

Conclusions: *The research provided many negative and positive aspects of the functioning of the dental care sector in Poland.*

Keywords: Oral Health, Dentists, Health Policy, Dental Care System

1. Introduction

Numerous studies of the oral health of Poles in particular age groups, conducted over the past years, indicate that dental care in Poland is insufficient and requires significant organizational and financial changes. The rate of dental caries in all age groups of children and adolescents has been the highest in Europe for years; 41% of 3-year-olds, 81% of 6-year-olds and 85% of 7-year-olds are affected by dental caries, in higher age groups the situation is even worse, over 93% of adolescents aged 18 have tooth decay [1]. As experts indicate, public preventive programs function to a small extent, less than half, or only 35%, of children aged 6 years are covered by prophylaxis; according to data from the Ministry of Health, fluoride prophylaxis covers approximately 4% of 5-year-old children and 48% of 12-year-olds and 7% of 15-year-olds, the situation is more unfavorable in rural areas than in cities [2,3]. A low percentage of children aged 6 and 7 have sealed first molars [4]. According to the Polish Ministry of Health, only 22% of eligible persons used dental care services under health insurance, and 2.96% of the population of children and adolescents used dental preventive services under public funds. Among young people, 56% of junior high school students are treated in private clinics, and only 20% of them use clinics contracted with the National Health Fund, and 16.7% use dental offices located in schools [1].

On the other hand, human resources in Poland, in terms of the number of dentists in relation to the population, are at one of the highest levels in Europe [5]. Over the last several decades,

many health programs have been implemented at the national and local levels, but none of the assumed goals have been achieved [6-9]. The dental care system in Poland is assessed in many key documents as very ineffective [10,11]. Most academic and research centers (both dental sciences and health promotion, public health, economics and management, health policy) in highly developed countries have been conducting quite detailed research for many years on selected elements of the functioning of the dental care sector within the health care system, with using comparable and internationally recognized criteria for assessing clinical conditions, epidemiological, socio-economic, efficiency and other indicators.

The Ministry of Health has been regularly monitoring the oral health of Poles for several years; such a system was implemented in cooperation with WHO in 1997 (provided that the monitoring program has not been continued at all in the last few years) [1]. There are many expert reports, but they concern primarily the state of oral health of the population, but there is no comprehensive research and in-depth analysis of the entire dental care sector, with particular emphasis on important HR, organizational, efficiency and financial aspects of healthcare providers, or an assessment of the functioning of healthcare providers [12-14].

2. Objectives

The main aim of the study was to analyze the performance of the dental care sector in Poland based on a study conducted among a group of dentists running dental offices, as part of various forms of medical activity in the context of literature research. The most important aspects of the functioning of dental offices, mainly organizational and financial, were examined.

3. Material and Methods

The cross-sectional study covered dental offices located mainly in the Silesian Voivodeship, as well as the Opolskie, Łódzkie and Świętokrzyskie Voivodeships. The study involved 610 dental offices representing various organizational forms (individual medical practice, group medical practice, and bigger medical entities). The subjects were selected randomly. Estimation of the minimum necessary sample size gave a value of 600 (assuming a confidence interval of 95%, inference error of 4%).

The study was based on an original questionnaire, containing 32 questions regarding all important aspects of the activities of dental offices in Poland, including: work organization, structure of employed support staff, quality of equipment and materials used, improvement of knowledge in the light of the latest scientific reports, availability of treatment, with particular emphasis on the group of children and adolescents up to 18 years of age, both under public funds (NHF) and private funds of patients, structure of dental services provided, financial conditions.

Several questions were open-ended in order to learn the personal opinions of people working in the researched sector. The questionnaire study was commissioned to trained students and graduates of the Faculty of Public Health of the Medical University of Silesia. The participation of medical facilities in the study was voluntary. Only authorized and trained persons could complete the questionnaires.

The study was carried out using the face-to-face interview technique. Statistical analyzes were carried out using the Shapiro-Wilk test. $\chi 2$ test, Mann-Whitney U test, Kruskal-Wallis test and Cramer's V coefficient, in addition, an assessment of the linear trend for qualitative variables was performed based on the Cochran-Armitage trend test. The level of statistical significance was $\alpha = 0.05$. Statistical analyzes were performed in the SAS statistical package version 9.4 (SAS Institute Inc., Cary, NC, USA). There was also a review of scientific literature and statistical data; national (MH and MSO) and international (WHO, OECD, Eurostat), documents of key institutions for the functioning of the health care system in our country, including dental care, were analyzed, such as: Ministry of Health, Supreme Audit Office, Supreme Medical Chamber, National Health Fund, Institute of Food and Nutrition. The work also uses the results of expert research, including: Social Diagnosis, recommendations of the Polish Dental Association. All key legal acts relating to the functioning of dental offices in the healthcare system in Poland were reviewed, including acts, regulations and orders.

4. Results

4.1. Presentation of Study Group - Age, Place of Work

In the surveyed group of dentists (n=600), the majority were women - 58.52%, men - 41.48%. The average age of dentists in the study group was 41.19 years. The largest group (35.57%) were dentists aged 30-40, the next group - 25.74% - people aged 40-50, 18.85% were doctors aged up to 30, and 15.25% doctors aged 50-60, while the smallest group - 4.59% - were people over 60.

When it comes to the location of dental offices, the largest group - 42.30% of respondents work in a medium-sized city (with 50-200 thousand inhabitants). The second group (29.84%) consisted of entities operating in large cities (over 200,000 inhabitants). The next group are entities operating in rural areas (15.25%). The smallest group was from small towns (up to 50,000 inhabitants) - 12.62%.

4.2. Form of Practicing the Profession and Specialization

In terms of the form of practicing the profession, the largest number of respondents recorded individual practices, they accounted for almost half of the respondents, i.e. 47.05% of the respondents, the next group are medical enterprises, which constituted 38.75% of the respondents, of which 29.18% are represented by doctors employed on the so-called employment contract, while the remaining 9.57% are dental offices represented by owners. Group medical practices have the smallest share, only 14.10% of respondents.

A relationship was found between the age of respondents and the form of business; the higher the age group, the higher the percentage of owners of individual or group medical practices. However, medical enterprises employ mainly young people full-time (e.g. 63.48% of doctors under 30 years of age). When it comes to owners of medical enterprises, middle-aged people dominate.

A relationship was found between the respondents' age, place

of business and specialization; the vast majority of doctors from younger age groups run their offices in medium-sized cities, while doctors aged between 40-60 run their offices in large cities. Most specialist doctors are people with extensive professional experience. Only 17.87% of the surveyed doctors had a specialization and they represented all specialization areas (Table 1)

Specialization	Number of dentists with specialization in surveyed group (percentage share)	Number of dentists with specialization in Poland (Ministry of Health) (percentage share)
Conservative dentistry with endodontics	23.15%	21.6%
Pedodotics	15.74%	9%
Orthodotics	12.04%	18.9%
Periodontology	2.78%	8.1%
Dental surgery	17.59%	14.8%
Maxio-fascialis surgery	2.78%	5.8%
Prothetics	8.33%	21.8%
General dentistry/ 1-st degree	17.59%	-

Table 1: Distribution of specialization in the study group comparing to data of Ministry of Health

4.3. Hiring Support Staff

The effectiveness of a dentist's work and the organization of the entire practice largely depend on the work of the support staff, which includes primarily: dental assistants, hygienists and registrars. When it comes to the structure of employed staff, by far the most dental offices employ assistants - 73.28% of all surveyed entities.

A statistical relationship was found between employing an assistant and the form of performing the profession, the location of the office and the level of income 60.3% of individual practices, 89.5% of group practices and 83.1% of medical enterprises employ assistants. The reason is probably economic reasons, i.e. high labor costs. 76.37% of offices located in large cities, 73.26% of offices located in medium-sized cities, 50.65% of offices in small towns and a quite high percentage of offices in rural areas, 86.02% employ assistants. Both the revenue and income generated were higher in units that employ assistants.
Dental hygienists are not employed that often, only 31.15% of all entities employ hygienists - 21.6% of individual practices, -33.7% of group practices and - 41.8% of medical enterprises. A relationship was found between the employment of hygienists and the form of business activity. Hygienists are more willing to be employed by larger entities, such as medical entities; economic reasons may be the reason for such behavior. 35.71% of entities in large cities, 34.50% of entities in medium-sized cities, 31.17% of offices in small towns and only 12.90% of offices in rural areas employ hygienists. A statistical relationship was found between the employment of hygienists and the location of the office, as well as the level of income, the income was higher in the units that employed them. In the surveyed group, 52.95% of entities employ female registrars; 23.7% of individual practices, 58.1% of group practices and 86.5% of dental offices.

A relationship was found between the employment of registrars and the form of business activity ($p<0.001$), place of work, level of income ($p<0.0001$), and the doctor's income ($p=0.005$); female registrars are much more often employed by larger entities, offices located in cities, both the revenue and income generated were higher in the entities that employ them.

4.4. Participation in Training, Self-Education

In the surveyed group, 5.57% of respondents declared participation in training very regularly, once a month, the largest group (29.02%) participated in training once a quarter, 28.52% participated once every six months, 25.57% participated once per year, and only 11.31% reported that they participated once every few years. Thus, over 60% of doctors participate in training several times a year, and 90% of dentists participate in training at least once a year. A relationship was found between the frequency of participation in training and the location of the office, as well as age. Doctors working in large and medium-sized cities participate in training more often than doctors from small towns and rural areas.

Doctors under 30 and aged 30-40 take part in training more often, every quarter or half a year, while older doctors, over 60, only take part in training once every few years.

Scientific journals may also be one of the sources of obtaining current knowledge. Less than half of the respondents, 46.56%, subscribe to dental magazines, the majority of respondents - 53.44% do not subscribe to them. A relationship was found between doctors' age, specialization and subscriptions to professional journals. The largest group that subscribes to the so-called magazines specialists are doctors aged 30-40, most specialists (58.33%) subscribe to the so-called professional magazines.

Research has shown that much less than half of the respondents, 30.82% of respondents, know what the term Evidence Based Dentistry means.

One of the key tools for improving work organization and operation of a dental office is obtaining any kind of a" certificate of quality". As the research results indicate, dentists strive for this, as 49% of respondents confirmed that their unit has a quality certificate. Among the offices that provide treatment under a contract with the National Health Fund, more have a certificate (54%) than among those that treat patients solely from their own funds (44.4%).

4.5. Work Under Public Funds (NHF)

Half of the surveyed entities - 50.49% work under a contract with the National Health Fund, while 49.51% of the respondents provide services only through patients' private funds. 42.86% of entities from large cities, 54.65% from medium-sized cities, 40.26% from small towns and 62.37% of rural offices work on the basis of a contract with the National Health Fund.

4.6. Office Equipment

It should be emphasized that dental offices in the surveyed group are quite well equipped. The equipment is relatively new, for example, the average age of dental units was from 5.53 to 7.74 years, and approximately 40% of them were brands highly rated in quality rankings, such as: Stern Weber, Kavo, OMS. When it comes to other elements of dental office equipment; approximately 80% of entities are equipped with an endometer, X-ray/RVG and a set for filling root canals, while half have a microscope and a panoramic radiograph. A higher percentage of offices in large and medium-sized cities and a much larger percentage of young doctors - up to 40 years old, are equipped with highly specialized diagnostic and therapeutic equipment than in rural offices and those in small towns (Table 2)

Diagnostic and therapeutic equipment	Supplied	Not supplied
Endometr	83,77%	16.23%
X-ray/rvg	79,51%	20.49%
Pantomograph	49,67%	50.33%
Filling kit root canals	81,97%	18.03%
Microscope	52,13%	47.87%
Internal camera	59,51%	40.49%

Table 2: Equipment of offices in the study group

4.7. Children's Participation and Structure of Services

Analyzing the structure of admitted patients, children and adolescents up to 18 years of age constitute 25.33% of all admitted patients. A relationship was found between the age of doctors and the percentage of patients from the group of children and adolescents ($p<0.01$). Doctors with higher experience are more willing to treat them than young patients. Adolescent patients constitute the largest group of patients among doctors aged 40-50 and 50-60, respectively: 28.69% and 26.22%. The smallest group of children and adolescents are treated by doctors under the age of 30 (20.77%).

Dental treatment consists of numerous components within individual specialties, the obtained research results indicate the percentage of individual types of services in the overall treatment of patients, it is as follows: prophylaxis 15.29%, conservative 56.49%, surgery 12.29%, prosthetics 10.52%, periodontology 5.43%. Preventive services constitute a small percentage of all services provided by the surveyed dentists. According to the estimates provided by the respondents, approximately 25% of them said up to 5%, and approximately 28% said 5-10%. This means that for more than half of the respondents (52.3%) it does not exceed 10% of the total number of services. It is significant that older doctors devote almost twice as much time to it in the structure of all services than young doctors. According to research results, doctors spend on average about 11% of the visit time on hygiene education of patients. Doctors working in rural offices devote more time to it, and older doctors devote almost twice as much time to health education as younger ones.

The removal of dental deposits is crucial both in the prevention and treatment of periodontal diseases. Middle-aged doctors with more professional experience pay more attention to patient education regarding tartar removal procedures.

4.8. Costs of running a business

According to respondents, the costs of the so-called fixed costs related to running dental offices (rental fees, utilities; electricity, heating, costs of employing auxiliary staff, as well as telephones, insurance, garbage collection etc) constitute on average 33.37% of the monthly revenue of dental offices. Approx. 30% stated that they constitute up to 20% of the revenue, half of the respondents indicated that they constitute 20-40%, and less than 10% of the respondents stated the value even above 50% of the revenue.

As research results show, most offices are equipped with modern diagnostic and therapeutic equipment. The information collected regarding loans or leasing, etc. for specialized equipment shows that doctors are quite reluctant to purchase equipment supported by various forms of financial loans. Only about 29.67% of the surveyed dental offices had such equipment, while 70.33% did not.The largest group (34.25%) who use various forms of investment loans are people aged 40-50.

Ab. 45% of the respondents indicated that their monthly income was below 5000 PLN (pre-inflation data, the national average at that time was approximately PLN 4.2 thousand), while approximately 35% indicated an amount between 5-10 thousand PLN, 20% had income above 10 000 PLN A statistical relationship was found between the level of income and the age of doctors which had the highest significance for the age group up to 30 years of age and reduced significance in subsequent age groups,. A statistical relationship was also found between doctors' income and the location of the office, in favor of large cities.

The information obtained regarding the ownership status of the premises in which the surveyed offices operate was analyzed. 62.62% of the surveyed doctors stated that they had an office in a rented premise, and 37.38% in an owned premise. When it comes to the size of premises in which dental offices are located, the so-called the average area of the rooms is 72.56 m^2.

4.9. Waiting Time for An Appointment

Waiting times for an appointment at dental offices vary. In offices providing treatment solely under private funds, the average waiting time for an appointment is approximately 6 days, while in offices providing treatment using public funds (NHF), the average waiting time for an appointment is more than three times longer, being approximately 21 days. However, there was a significant difference between the waiting time for an appointment under the National Health Fund between urban and rural areas. In a large city, the waiting time for an appointment (under the National Health Fund) was 24.33 days, in medium-sized cities it was 22.03 days, in small towns it was 21.45 days, and in rural areas it was 13.97 days. The situation was similar in the case of waiting time for an appointment in offices providing treatment only under the so-called patients' own funds. The waiting time is definitely shorter and amounted to an average of 7.47 days in large cities, 7.21 days in medium-sized cities, 5.87 days in small towns and 4.39 days in villages.

A relationship was found between the waiting time for a visit to dentists (so-called general practitioners) and specialists, the average waiting time for a visit to a specialist doctor (under the National Health Fund) is 38.26 days, and to a non-specialized doctor - 17.93 days.

In offices where patients are treated under private funds, the average waiting time for an appointment is shorter and amounts to 7.49 days for a specialist and 6.51 days for a non-specialized dentist.

4.10. Dentist's Working Time

As shown by the research results, the average working time (at the chair) of dentists in the study group is 31.61 hours per week, which gives an average of 6.32 hours per day at the chair. The largest group of doctors (40.16%) work 31-40 hours a week, which is 6-8 hours a day, 26.39% of doctors work 21-30 hours a week, i.e. 4-6 hours a day, while 24.26% of doctors work up to 20 hours a week (4 hours a day), 9.18% of respondents say that they work a lot, more than 40 hours a week, i.e. more than 8 hours a day.

Doctors in large cities work shorter hours at the chair compared to doctors from medium-sized and smaller towns and villages, young people work the longest, and the number of hours worked per week at the chair decreases as the age group increases.

4.11. Interviewing the Patient, Documentation

Due to the multitude of aspects that need to be carefully examined, collecting an interview requires an appropriate amount of time. In practice, doctors often spend too little time on this first part of the patient's visit. The results of the conducted research indicate that the average interview time is 6.78 minutes. Older dentists spend almost twice as much time on this as younger one. Specialized doctors spend an average of 8.66 minutes on interviewing patients, while non-specialized dentists spend 6.37 minutes. In the surveyed dental offices, the dominant way of keeping medical records is in paper form; 47.38% of respondents keep it only in paper form, 23.44% of surveyed doctors keep documentation only in electronic form, while 29.18% of respondents keep it in both forms; electronic and paper.

11. System Evaluation

The health care system, and in particular the dental care system, has a huge impact on the functioning of dentists. The organizational and financial assumptions adopted, as well as the stability of the system itself, are of great importance in relation to doctors' behavior. The majority of respondents assessed the system strongly negatively, 74.26% of respondents assessed that the dental care system in Poland is poorly organized. Doctors running their offices in small towns and villages mostly rated the system worse than those from large cities, with more critical opinions recorded in the group of the youngest doctors.

Respondents defined the key disadvantages of the organization of dental care in our country:

1. Lack of: organized dental care in kindergartens, early prevention, and family education
2. Lack of: proper dental care in schools, both in terms of school education and the presence of hygienists.
3. Lack of: system for monitoring patient attendance at office visits, which has been introduced in many countries, mainly in relation to dental check-ups, which are rewarded with bonuses, no consequences for not showing up for a treatment visit financed by the National Health Fund.
4. No orthodontic treatment under the National Health Fund for children over 15 years old.
5. Children's access to treatment is generally difficult.
6. Lack of effective prevention activities among children and adolesents.
7. Low expenditure on dentistry, which results in underfinancing of the sector in the form of undervalued procedures, a very limited limit of benefits under the contract with NHF, a small number of contracts with dentists, the so-called general and with specialists.
8. Reimbursement of treatment under the National Health Fund using low-quality materials
9. Bureaucracy, lack of stable, long-term health policy, lack of system predictability, variability of National Health Fund policy
10. Small number of contracts with specialists.
11. Lack of any support mechanisms for dentists working for public sector.

5. Discussion

The research results provide a lot of positive information about the functioning of the dental care sector in our country, and show those areas of the activities of healthcare providers that would require improvement or even significant changes.

The human resources of dentists in Poland are quite high, according to According to Main Statistical Office data, the total number of dentists is ab. 9 per 10 000. population [15]. This is one of the highest levels in Europe, the average for EU is 8 per 10 000, although it should be noted that indicators regarding the human resources of dentists in individual countries are difficult to compare due to methodological differences in the scope of the presented data [16]. In some countries, data on the number of dentists include only salaried doctors, in others the number refers to all doctors authorized to practice dentistry. The second issue that should be emphasized is the fact that the Ministry of

Health in Poland does not have any documents analyzing the annual demand for dentists, and admission limits for medical studies are set solely on the basis of the demand reported by medical universities. Therefore, the admission limits set in the regulations do not reflect the real needs of the health care system in our country. Resources in individual regions of the country are also not verified, here we also note very large differences between voivodeships, the largest group of doctors practice their profession in the following voivodeships: Masovia, Silesia, Lesser Poland, Łódź and Lower Silesia [17].

Dentists are a highly feminized professional group in our country, the structure of the selected research group does not fully reflect this, but statistical data indicate a significantly higher number of women than men in this professional group (76% to 34%, respectively) [5]. According to Medical Chamber data, the largest age group is people aged 41-50 the average age is 46, while in the research group these were people aged 30-40 [18]. About 20% of dentists in Poland have specialization. The lowest number was recorded among periodontal disease specialists; in the study they constituted 2.8%, while according to Medical Chamber data they constitute 1.25% in the group of specialists, which significantly contrasts with the fact that periodontal diseases are the second cause of tooth loss after tooth decay, and a quite advanced disease among Poles. The average age of dentists specializing in various fields of dental sciences significantly exceeds 50 years [18].

The dominant form of conducting medical activity is individual medical practice (47% of respondents), it is especially preferred by doctors over 50 years of age (70%), while younger doctors (up to 30 years of age) are mostly full-time employees of medical entities (63%). The form of group practice, quite common in highly developed countries, and recommended by WHO, has not been adopted in Poland (14% of respondents among young dentists, and up to the age of 30- only 3.5% chose this type of entity). The second form of conducting business is the so-called medical entities/enterprises (approx. 39% of the surveyed dentists are either owners or employees). The results of our own research regarding the forms of running a business are consistent with the results of nationwide registers [17].

The effectiveness of a dentist's work is largely determined by the support of the auxiliary staff (dental assistant, dental hygienist) but the majority of those in group practice (89%) and healthcare enterprises (83%) do not employ assistants. Doctors either do not appreciate this fact or their behavior is determined by economic constraints. It should also be noted that, as research results show, both the revenue and income generated were higher in those units that employ dental assistants. The profession of a dental assistant and hygienist in Poland is regulated by law [19]. In Europe, it is regulated by law in 22 countries and their role is increasing [20-22]. As research results indicate, only approximately 31% of entities employ hygienists, and this applies more to medical enterprises than to medical practices (twice as many). It should also be noted that, it is incomprehensible that hygienists were employed less frequently in the group of entities contracted with the National Health Fund, compared to those that provide treatment solely using private funds. In the light of contemporary requirements for professional education and prevention in dental offices, it is puzzling that the public payer institution does not reward or impose any requirements on the employment of dental hygienists.

Female registrars, on the other hand, are much more willing to be employed by larger enterprises, in large and medium-sized cities, over 50% of doctors employ female registrars. The research results clearly showed a similar pattern as in the case of assistants and hygienists - both the income and income generated were higher in units that employ registrars. The results indicate that offices that have a contract with the National Health Fund are more willing to employ assistants and registrars.

Research results indicate that dentists improve their skills in a satisfactory manner (over 60% of dentists participate in training several times a year, and 90% take part in them at least once a year). Doctors working in large and medium-sized cities, as well as representatives of lower age groups (up to 30 years old and 30-40 years old) and those who do not have a contract with the National Health Fund, participate in training more often. One of the forms of improving qualifications is access to professional literature; the majority of respondents do not subscribe to professional magazines, and among those who subscribe to them, the largest group are doctors from the age groups of 30-40 and 40-50 years (over 50%), the vast majority among specialists and doctors who run their offices based on the patient's private funds.

Evidence based dentistry generally was defined by the American Dental Association as a combination of 3 elements: clinically relevant scientific evidence relating to the oral health, the dentist's experience and clinical knowledge, and the treatment needs of the patient. Research has shown that much less than half of respondents (approx. 30%) know what the term evidence-based dentistry means. Among doctors who are able to define this term, the larger group are people aged 30-40 and those who run offices that provide treatment solely under private funds. These results are similar to those obtained in a survey conducted in International Dental Federation member countries, in which 32.8% of dentists indicated that they knew what this term meant [23]. Experts identify the obstacles for dentist in more common access to ebd as the low level of English language proficiency, the lack of dentists' own time, limited number of national clinical protocols [24,25].

When it comes to quality certificates, approximately half of the respondents have a quality certificate, which may be due to the fact that the National Health Fund has been rewarding possession of a quality certificate with additional points in tender competitions for several years. As research results indicate, dental offices in Poland are quite well equipped. The equipment is relatively new, e.g. the average age of dental units was 5 - 7 years. Approximately 80% of the entities are equipped with an endometer, X-ray/RVG and a set for filling root canals, while half of the entities have a microscope and a panoramic radiograph. A higher percentage of offices in large and medium-sized cities are equipped with highly specialized diagnostic and therapeutic equipment. The obtained results indicate that offices providing treatment under the National Health Fund have slightly better equipment than offices providing treatment exclusively

privately. This may be due to the fact that the National Health Fund additionally rewards the possession of certain devices during the tender competition. A larger percentage of young doctors - up to 40 years old - have modern, precise diagnostic and therapeutic equipment.

As research results indicate, on average, children and adolescents up to 18 years of age constitute approximately 25% of all patients seen in offices. Significantly, doctors with higher experience are more willing to treat children than young dentists. There was also significant variation in treatment in regard to children and adolescents, as well as the materials used in offices contracted with the National Health Fund and those that treat exclusively through private funds. Our results indicate that in the dental treatment of patients, the largest share is by far conservative treatment; over 50% of all services provided. Specialized treatment is provided more often in cities than in villages, while the number of preventive services increases with the age of the doctor; older doctors spend almost twice as much time on it than younger doctors. Doctors working in rural offices and older doctors devote almost twice as much time to health education as younger ones. On the other hand, international research identifies three most common reasons for visit: check-up (77%), clean (57%) and tooth pain (36%) [26].

Financial conditions are an extremely important aspect determining the quality of operation of dental offices and their development. Regarding work environmental factors income and practice management are mentioned by dentists among as the least satisfied factors [27].

The conducted research aimed to verify several important economic issues. The results indicated that the costs of the so-called fixed costs related to running offices are quite significant, and 30% of units have a loan or leasing related to the purchase of equipment. Since the privatization of the dental care sector in Poland began in 1999, the entire financial burden of equipment has been borne solely by healthcare providers without any form of public support.

As shown by the research results, the average working time (at the chair) of dentists is 31.6 hours per week, which gives an average of 6.3 hours per day at the chair. The largest group of doctors (40%) works 31-40 hours a week, which is 6-8 hours a day, which seems to be consistent with the provisions of the Act on medical activities regarding the working time of medical staff [28]. It's important to note that no act regulates the working time of a doctor who owns his practice, the act only regulates the working time of medical staff employed in a healthcare enterprise up to 7.35 hours a day.

An extremely important stage of the first visit is interviewing the patient. The results of the conducted research confirm not-so-good practices; the interview time taken by dentists on average is 6-7 minutes. It should be emphasized that collecting all relevant information regarding the health condition of the patient and recording it accurately helps to avoid many errors during the patient's treatment and what is very important is very effective in reducing dental anxiety and fear [29].

The waiting time for a doctor's visit reflects the availability of dental care. The research results showed that the average waiting time for a visit to offices under private funds is approximately 6 days, while under public funds (NHF) the average waiting time is more than three times longer, amounting to approximately 21 days. A significant difference was noted in the waiting time for an appointment under the National Health Fund between urban and rural areas, and the situation is similar in the case of waiting time for an appointment in offices treating only under the so-called patients' own funds. A relationship was also found between the waiting time for visits to generalist and specialist dentists.' As data from the USA indicate, the average waiting time for a visit to the so-called general dentist is 17.2 days for a first-time patient and 10.5 days for a so-called regular patient, while the waiting time to see a specialist is shorter, which is 11.8 days for a first-time patient and 9.3 days for the so-called permanent patient [30].

The research results provide positive information regarding job satisfaction, the majority of surveyed dentists are satisfied with their work, and only 6% of respondents do not feel job satisfaction. Doctors who run offices in small towns and villages and older people who have contracts with the National Health Fund are definitely more dissatisfied. Numerous findings show that dentists in vast majority are satisfied with their jobs and specialists were more satisfied than general dentists [31,27]. At the same time, it is worth emphasizing the relatively high job satisfaction, despite the numerous systemic defects and unfavorable environment indicated by doctors. Most doctors are very critical of the dental care system in Poland; 75% of respondents assessed that dental care in Poland is poorly organized. Doctors precisely indicated the most neglected areas, which could constitute recommendations for politicians responsible for dental health care in our country.

6. Conclusions

The results of the analysis of numerous documents, statistical data, publications and expert reports as well as the results of surveys allow the conclusion that public authorities in Poland participate to a very limited extent in organizing, financing, securing and supervising dental care in Poland, the vast majority of service providers are private entities, and the level of financing of services from public funds (NHF) is low. Specific positive and negative systemic phenomena have been defined. A serious problem is the lack of supervision over children and adolescents, it can be said that, in a sense, the state has withdrawn from dental care in schools, numerous implemented public programs have low effectiveness and are not monitored or evaluated. The authorities do not incur expenditure on infrastructure, these costs have been completely transferred to service providers. Patients incur very high costs of treatment from their own funds, because only a small number of health services are financed from public funds, and the number of offices providing treatment under insurance is systematically decreasing (there are no systems to support private expenses, such as additional insurance, tax deductions, etc.). There are no analyzes of health needs, there is no policy regarding human resources and specializations, both for dentists and secondary staff, e.g. hygienists. There are no tools to compensate for socio-economic barriers in access to treatment. We observe lack of coordination of policy, lack of cooperation

of the National Health Fund with regional and local authorities. Human resources are at a high level (one of the highest in the EU). On the other side dental offices are very well equipped (with high financial involvement of healthcare providers), the latest technologies are used in the diagnostic and therapeutic process and doctors systematically improve their professional skills and willingly implement quality standards. Dentists largely provide care for children and adolescents, as 25% of the patients they see are adolescents up to 18 years of age, although mainly in the field of restorative dentistry. Hygienists are employed in a small number of offices. In offices that have a contract with the National Health Fund, patients treated only under insurance constitute less than 30% of all patients, the average waiting time for an appointment under public funds is more than three times longer than in offices treating under private funds, in the process treatment of children. In offices providing treatment under private funds, more modern technologies are used than in offices providing treatment under the National Health Fund.

Disclosures: Financial support and sponsorship: this work was support by Medical University of Silesia in Katowice, grant number: KNW-1-124/K/9/Z

References

1. Monitorowanie stanu zdrowia jamy ustnej populacji polskiej (wyniki raportów z lat 2009-2020).
2. https://archiwum.mz.gov.pl/zdrowie-i-profilaktyka/programy-zdrowotne/wykaz-programow/monitorowanie-stanu-zdrowia-jamy-ustnej-populacji-polskiej-w-latach-2013-2015/
3. Turska-Szybka, A., Soika, I., Kalita, M., Gozdowski, D., & Olczak-Kowalczyk, D. (2016). Stan uzębienia uczniów szkół gimnazjalnych na podstawie Monitoringu Stanu Zdrowia Jamy Ustnej i Jego Uwarunkowań w 2015 roku w województwie mazowieckim. Część I. Choroba próchnicowa. Nowa Stomatologia.
4. Olczak-Kowalczyk, D., Borysewicz-Lewicka, M., Adamowicz-Klepalska, B., Jackowska, T., & Kaczmarek, U. (2016). Stanowisko polskich Ekspertów dotyczące indywidualnej profilaktyki fluorkowej choroby próchnicowej u dzieci i młodzieży. *Nowa Stomatologia.*
5. Dane GUS, GUS zdrowie_i_ochrona_zdrowia_2022_2.pdf
6. Narodowy Program Zdrowia na lata 1995-2006.
7. Narodowy Program Zdrowia na lata 2007-2015.
8. Narodowy Program Zdrowia na lata 2016-2029
9. Rolińska, D., Krajewska, A., & Jarosz, M. J. (2017). Rola programów zdrowotnych w profilaktyce próchnicy zębów u dzieci i młodzieży. *Aspekty zdrowia i choroby, 2*(2).
10. Kontroli, N. I. (2013). Dostępność i finansowanie opieki stomatologicznej ze środków publicznych. Nr ewid.
11. Naczelna Izba Kontroli. Dostępność i finansowanie opieki stomatologicznej ze środków publicznych. KZD.430.6.2023 Nr ewid.
12. Jodkowska, E., Wierzbicka, M., Rusyan, E., & Strużycka, I. (2013). Publiczny program zapobiegania próchnicy w Polsce u dzieci w wieku 5, 7, 15 lat, realizowany w roku 2011. *Przegl Epidemiol, 67,* 765-768.
13. Pawka, B., Dreher, P., Herda, J., Szwiec, I., & Krasicka, M. (2010). Próchnica zębów u dzieci problemem społecznym. *Probl Hig Epidemiol, 91*(1), 5-7.
14. Woynarowska, B., & Oblacińska, A. (2014). Stan zdrowia dzieci i młodzieży w Polsce. Najważniejsze problemy zdrowotne. *Studia BAS, 2* (38), 41-64.
15. Dane GUS, accessed: www.stat.gov.pl
16. Health at a glance: Europe 2022, OECD/European Union 2022, p. 183
17. Centrum e- Zdrowia, raporty online 2022.
18. https://rejestr.nil.org.pl/
19. Ustawa z dnia 17 sierpnia 2023 r. o niektórych zawodach medycznych Dz. U. 2023 poz. 1972
20. Dobrow, M. J., Valela, A., Bruce, E., Simpson, K., & Pettifer, G. (2024). Identification and assessment of factors that impact the demand for and supply of dental hygienists amidst an evolving workforce context: a scoping review. *BMC Oral Health, 24*(1), 631.
21. Rederiene, G., Bol-van den Hil, E., Pajak-Lysek, E., & Eaton, K. A. (2024). The employment of dental hygienists in European countries: Report of a European Dental Hygienists Federation/European Association of Dental Public Health Survey in 2021. International Journal of Dental Hygiene.
22. Miura, H., Tano, R., Oshima, K., & Usui, Y. (2021). Analysis of factors related to working status of dental hygienists in Japan. *International Journal of Environmental Research and Public Health, 18*(3), 1025.
23. Yamalik, N., Nemli, S. K., Carrilho, E., Dianiskova, S., Melo, P., Lella, A., ... & Margvelashvili, V. (2015). Implementation of evidence-based dentistry into practice: analysis of awareness, perceptions and attitudes of dentists in the World Dental Federation–European Regional Organization zone. *International dental journal, 65*(3), 127-145.
24. Chiappelli, F. (2019). Evidence-based dentistry: two decades and beyond. *Journal of Evidence Based Dental Practice, 19*(1), 7-16.
25. Krut, A. G. (2022). USE OF EVIDENCE-BASED MEDICINE BY DENTISTS. *Wiadomości Lekarskie, 75*(5), 1100-1104.
26. Dang, M. H., Kim, J. G., Yang, Y. M., & Lee, D. W. (2021). Dentist job satisfaction: a systematic review and meta-analysis. *international dental journal, 71*(5), 369-377.
27. Gray, L., McNeill, L., Yi, W., Zvonereva, A., Brunton, P., & Mei, L. (2021). The "business" of dentistry: Consumers'(patients') criteria in the selection and evaluation of dental services. *PloS one, 16*(8), e0253517.
28. Dnia, U. (15). Kwietnia 2011 r. o Działalnosci Leczniczej. Bill on Therapeutic Activities.(Dz. U. 2011 nr 112 poz. 654).
29. Kurki, P., Korhonen, M., Honkalampi, K., & Suominen, A. L. (2023). The effectiveness of a diagnostic interview and modified one-session treatment for dental anxiety in primary dental care—a pilot study. *Special Care in Dentistry, 43*(2), 174-183.
30. Yang J. (2024). Patient wait times for U.S. dental appointments in 2022, by dentist type Published.
31. Kobza, J., & Syrkiewicz-Świtała, M. (2018). Job satisfaction and its related factors among dentists: A cross-sectional study. *Work, 60*(3), 357-363.