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Research article

The role and responsibilities of the primary care physician in the care of post-COVID-19 patients

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Abstract

Introduction Primary care physicians play a key role in managing patient access to healthcare. The COVID-19 pandemic has changed the organization of access to healthcare, giving primary care professionals (doctors, nurses, physiotherapists) additional tools for communicating with patients, in particular the possibility of communicating remotely (teleconsultations) through both verbal and video communication.

Objective The role and tasks of primary care physicians in the face of the emergence of a new disease entity.

Material and methods For patients who had ICD codes after 2019 (and practically from 2020), additional data was collected on gender, age from 2018 to 2024, divided into subsequent years. The analyzed data set covered 68,926 people who were provided with healthcare services in all primary care healthcare facilities of the Ministry of Interior and Administration.

Results The number of patients in individual organizational units who had COVID-related diagnoses after 2019/2020 is presented in the table below. The number of patient's visits has been steadily decreasing, with an average rate of decline of "-2.66%".

Discussion Disease definitions and the assignment of a diagnostic code are often asynchronous and iterative. Despite the relatively early recognition of this condition, ICD-10 connected with COVID codes were not used in clinical settings until October 2021, and currently this group of codes may also prove insufficient (taking into account the phenotypic variability and severity of the disease) for marking post-COVID cases.

Conclusions Considering the possibility of various complications generated by a given disease entity, it is extremely important to assign it to a given code, not only for statistical reasons.

Streszczenie

Wprowadzenie Lekarze POZ odgrywają kluczową rolę w zarządzaniu dostępem pacjenta do opieki zdrowotnej. Pandemia COVID-19 zmieniła organizację dostępu do opieki zdrowotnej dając profesjonalistom POZ (lekarze, pielęgniarki, fizjoterapeuci) dodatkowe narzędzia komunikacji z pacjentem, w szczególności możliwości porozumiewania się na odległość (teleporady) zarówno poprzez komunikację werbalną, jak i video.
Cel Rola i zadania lekarza podstawowej opieki zdrowotnej w obliczu powstania nowej jednostki chorobowej.
Materiał i metody Dla pacjentów, którzy mieli wykazane kody ICD po roku 2019 (a praktycznie od roku 2020) pobrano dodatkowo dane dotyczące płci, wieku od 2018r do 2024 w podziale na kolejne lata. Analizowany zbiór danych objął 68 926 osób, którym udzielano świadczeń zdrowotnych we wszystkich POZ MSWiA.
Wyniki Liczba pacjentów w poszczególnych jednostkach organizacyjnych, którzy po 2019/2020r mieli wykazane rozpoznania związane z COVID-19 , jest prezentowana w poniższej tabeli. Liczba pacjento-wizyt wykazuje stałą tendencję spadkową, z średnim tempem spadku o „-2,66%".
Dyskusja Z uwagi na wykrycie nowej choroby pojawiła się konieczność zastosowania nowej nomenklatury. Definicje choroby i przypisanie kodu diagnostycznego są często asynchroniczne i iteracyjne. Pomimo stosunkowo wczesnego rozpoznania tego stanu, kody ICD-10 związane z COVID nie były używane w warunkach klinicznych aż do października 2021 r., obecnie ta grupa kodów może okazać się również niewystarczająca (biorąc pod uwagę zmienność fenotypową i ciężkością przebiegu choroby) dla oznaczania przypadków post-COVID.
Wnioski Biorąc pod uwagę możliwość różnorodnych powikłań generowanych przez daną jednostkę chorobową niezwykle ważne jest jej przypisanie do danego kodu, nie tylko z powodów statystycznych.

Keywords *primary care physician, COVID-19, care coordination*
Słowa kluczowe *podstawowa opieka zdrowotna, COVID-19, koordynacja opieki*

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Introduction

The role of primary care physician in Poland is performed by family physicians and physicians working in facilities providing healthcare services to patients under contracts that are publicly funded through the National Health Fund (Narodowy Fundusz Zdrowia - NFZ). Such contracts can also be established with individual medical practices. As a group, physicians providing primary care in ways described above can be conventionally referred to as a primary health care physicians. Primary care physicians play a key role in managing patients' access to healthcare. The COVID-19 pandemic has transformed healthcare access, providing primary care professionals (doctors, nurses, physiotherapists) with additional tools for communicating with patients, particularly the ability to communicate remotely (teleconsultations) via both verbal and video communication. The crucial role of this group of medical professionals has been particularly visible during the pandemic, but it is also growing in the care of patients who have recovered from COVID-19, who can be defined as the post-COVID group (PCS). PCS patients present a wide range of complex and multifaceted complaints, including a wide variety of symptoms (varying in terms of the problems experienced, as well as affecting various organs and senses).

Primary care physicians are often the first point of contact for these patients, and their role encompasses a whole range of tasks, from initial diagnosis to ongoing management and care coordination. The lack of a definitive test for PCS requires initial diagnosis and treatment coordination based on patient-reported symptoms [1,2]. Research indicates that diagnosis is often based on an interview, clinical assessment, and the patient's health history. This approach is the only one available due to the lack of established criteria for LONG COVID or post-COVID states [3,1]. Typical PCS symptoms include fatigue, shortness of breath, and cognitive impairment, which should be assessed before making a different diagnosis [4,5]. The ambiguous ICD-10 code poses a challenge in correctly analyzing electronic data in this area. As COVID-19 was a new disease, its detection has necessitated the use of a new nomenclature. However, disease definitions and diagnostic code assignment are often asynchronous and iterative. Despite the relatively early recognition of this condition, ICD-10-CM codes [Table. 2] were not used in clinical settings until October 2021. Currently, this group of codes may also prove insufficient (given the phenotypic variability and disease severity) for labeling post-COVID cases. Given the potential for various complications generated by a given disease, assigning it to a specific code is extremely important, not only for statistical reasons.

Material and methods

The National Medical Institute of the Ministry of the Interior and Administration supervises several primary health care units in various locations, actively participating in providing primary care to patients [6]. The analysis was based on the primary health care units listed in

Table. 1 two organizational units were excluded from the analysis on the basis of:

a) not reporting any patients after 2020 (in the case of POZ in Mława);

b) providing services exclusively on commercial basis.

The analysis was based on data from 11 Primary Healthcare Facilities (Podstawowa Opieka Zdrowotna – POZ) reported electronically to the Clininet system of the National Medical Institute of the Ministry of Interior and Administration (the analyses were performed after the electronic process of anonymizing sensitive patient data).

Unit name	Address
POZ Wołoska 137	02-507 Warsaw, Wołoska Street 137
POZ CIECHANÓW	06-400 Ciechanów, Mickiewicza Street 8
CHILDREN POZ Wołoska	02-507 Warsaw, Wołoska Street 137
POZ POP	Kopernika Street 3, 07 -200 Maków Mazowiecki
POZ PŁOŃSK	Płocka Street 33, 09 -100 Plonsk
POZ Sandomierska Polyclinic	02-567 Warsaw, Sandomierska Street 5/7
POZ PUŁTUSK	Piotra Skargi 31/1, 06 -100 Pułtusk
POZ RADOM	26-615 Radom, 5 Orląt Lwowskich Street
POZ SIEDLCE	08-110 Siedlce, Starowiejska Street 66
POZ Wołoska I (Frascati)	02-507 Warsaw, Wołoska Street 137
POZ OSTORŁĘKA	Gen. Tadeusza Kosciuszki 27, 07-410 Ostrołęka

Table. 1 *List of primary health care facilities data from which were included in the analysis*

The following ICD-10 codes representing patients' diagnoses as their main or co-occurring diagnosis after 2019 were sourced from the Institute's clinical databases (Clininet system by CGM):

ICD-10 code	**ICD-10 code name**
U07.1	COVID-19 identified
U07.2	COVID-19 not identified
U08	Patient's history of COVID-19
U08.9	Patient's history of COVID-19, unspecified
U09	Patient health after COVID-19
U09.9	Patient's health after COVID-19, unspecified
U10	COVID-19-associated multisystem inflammatory syndrome
U10.9	COVID-19-associated multisystem inflammatory syndrome, unspecified

Table. 2 *Analyzed ICD-10 codes*

For patients who had codes presented in Table. 2 assigned after 2019 (and effectively from 2020), additional data were collected on gender and age from 2018 to 2024, broken down by subsequent years. The analyzed dataset covered 68,926 individuals who received healthcare services at all primary healthcare facilities of the Ministry of Interior and Administration. PESEL identifiers in clinical databases were anonymized, and analyses were conducted on data that did not contain sensitive personal information.

Results

The number of patients who visited the individual organizational units, diagnosed after 2019/2020 within the scope of ICD-10 codes presented in Table. 2 is provided in the table below [Table. 3] The

Unit	2018	2019	2020	2021	2022	2023	2024	Medium-term pace of change of primary health care facility
POZ Wołoska 137	10175	9500	8533	8435	7528	6764	8735	**-2.51%**
POZ CIECHANÓW	3812	3555	3549	3631	3526	2785	3619	**-0.86%**
CHILDREN POZ Wołoska	3838	3677	2647	2872	2778	1588	2641	**-6.04%**
POZ POP	1205	1209	1179	1169	1089	961	1114	**-1.30%**
POZ PŁOŃSK	1169	1145	1094	1210	1081	853	1057	**-1.66%**
POZ Sandomierska Polyclinic	7390	6996	6484	6530	5717	4328	5285	**-5.43%**
POZ PUŁTUSK	941	907	843	904	814	659	844	**-1.80%**
POZ RADOM	9666	9166	8443	8791	7986	5938	8087	**-2.93%**
POZ SIEDLCE	4791	4849	4003	4232	3809	2981	4398	**-1.42%**
POZ Wołoska I (Frascati)	1327	1345	1231	1269	1181	830	1068	**-3.55%**
POZ OSTORŁĘKA	887	873	830	744	729	663	799	**-1.73%**

Table. 3 *Number of patient visits with codes shown in 2020-2021before and after the pandemic*

number of visits shows a steady downward trend, with an average rate of decline of -2.66%.

The highest negative dynamics could be observed in the primary healthcare facility in Sandomierska (-5.43%), the primary healthcare facility Wołoska I (Frascati) (-3.55%), and the primary healthcare facility in Radom (-2.93%). The lowest negative dynamics were observed in the primary healthcare facility in Ciechanów (-0.86%), the primary healthcare facility in Maków (-1.30%), and the primary healthcare facility in Siedlce (-1.42%). However, the average dynamics of the number visits in the analyzed period in the primary healthcare facilities in Wołoska, Wołoska I (Frascati), and the primary healthcare facility in Radom was quite consistent with the general rate.

Figure 1 presents a graphical representation of the change in the number of visits in the discussed period.

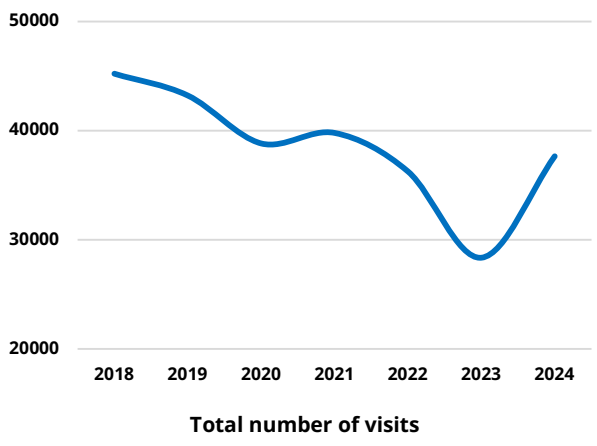

Figure 1 *Change in the total number of visits in years*

The overall medium-term rate of change in the analyzed period was i_g = -3.00%.

The gender distribution of the analyzed sample is presented in Figure 2. The gender structure of the sample did not present any significant changes in the analyzed years.

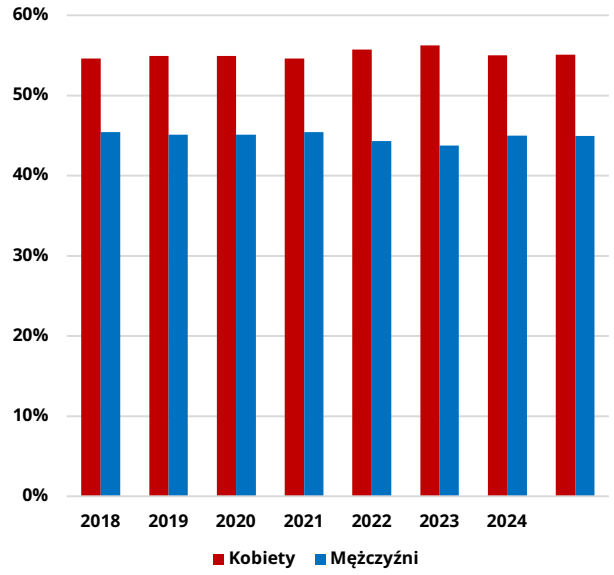

Figure 2 *Evaluation of similarity of the gender distribution structure*

The similarity index was *Wp* = 0.98. The shape of the structure is quite constant and unchanging over time, with an average value of 55% for women and 45% for men [Figure 2]

The age-specific structure of the patient population was also highly stable in the years 2018–2024 [Figure 3].

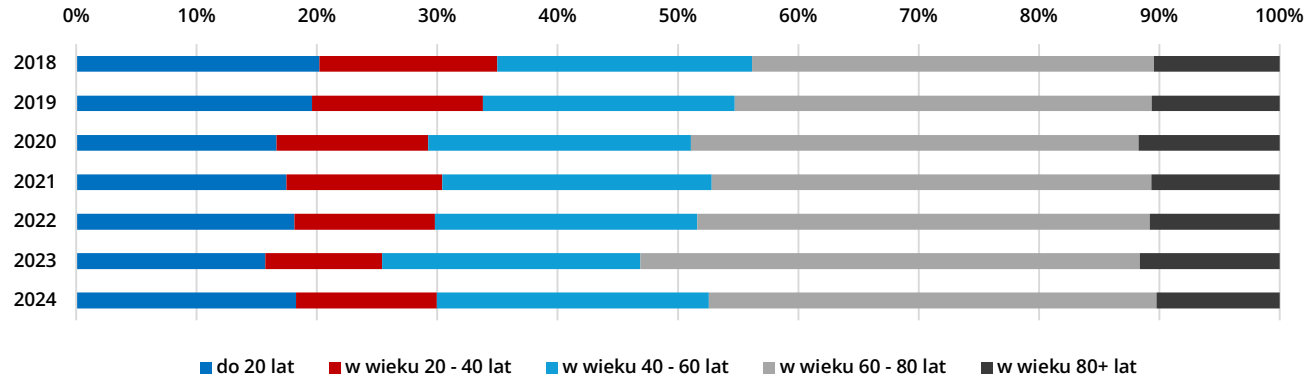

Figure 3 *Age distribution of primary care patients in the studied period*

In each of the years analyzed, the age distribution of patients was also similar. The majority (approximately 40%) of patients were aged 60-80, with over 20% of patients aged 40-60, and one in five patients under 20.

Discussion

Given the multisystemic nature of the symptoms and ailments associated with post-COVID conditions, primary care physicians (PCPs) often need to act as coordinators of multidisciplinary care. This includes referring patients to specialists, physiotherapists, psychologists, and other medical professionals to address the physical, mental, and social aspects of the disease [7,2] However, barriers such as limited access to specialized services and diagnostic uncertainty can complicate this process [1,5] The role of family physicians and PCPs regarding this group of patients is fundamental to patient education and providing emotional support (increasing patients' sense of security). These actions should include, in particular, advising patients on lifestyle modifications, such as activities related to a change of pace of life, to avoid symptom exacerbation and addressing psychological issues [2,8,5]. Despite their central and coordinating role, PCPs face several challenges in managing post-COVID patients. These include limited scientific knowledge about this condition, insufficient educational materials, and a lack of standardized guidelines for diagnosis and treatment [3,1]. This role is further complicated by the complexity of post-COVID symptoms and the need for prolonged follow-up, which can be time-consuming and demanding of human, diagnostic, and rehabilitation resources [5,9]. To enhance the role of primary care physicians in this aspect of healthcare, there is a crucial need to develop and publicly share clinical standards and guidelines, as well as publicly and freely available educational resources.

Research highlights the importance of providing primary care physicians with an evidence-based framework for diagnosis, symptom management, and rehabilitation [10,11]. Reducing administrative burdens and increasing access to multidisciplinary services would also be desirable, and indeed could prove essential, as it would allow primary care physicians to better focus on patient care, therefore increasing the patients' sense of safety [12]. The role of primary care physicians as coordinators and "guardians" of the healthcare system in Poland (as well as in other countries) requires the provision of opportunities and tools (legal, economic, and organizational) that enable a holistic approach to patients under their care. The role of primary care physicians within the healthcare system (of any given country) provides a good foundation for the full implementation of this task [13,14,15].

Appendix 1

Key roles and challenges of primary care physicians (GPs, family doctors)

Role	Responsibility	Citations
Diagnosis and assessment	Family physicians evaluate symptoms and rule out other causes through clinical assessment and patient history.	Moreels et al. 2024, Schulze et al. 2024, Bachmeier & Akker 2023
Management and treatment	Family physicians use pharmacological and non-pharmacological interventions to address symptoms.	Brode & Melamed 2024, Ahmad et al. 2024, Kokkinakis et al. 2023
Coordinating multidisciplinary care	Family physicians refer patients to specialists and coordinate care with other healthcare professionals.	Broughan et al. 2024, Rijpkema et al. 2024
Patient education and support	Family physicians educate patients on symptom management and provide emotional support.	Rijpkema et al. 2024, Pavlic et al. 2023, Bachmeier & Akker 2023
Challenge	Family physicians face limited knowledge, diagnostic uncertainty, and resource constraints.	Moreels et al. 2024, Schulze et al. 2024
The need for standardized approaches	Family physicians require the development of guidelines and educational resources for effective care.	Brode & Melamed 2024, Siso-Almirall et al. 2021
The importance of a holistic approach	Family physicians address physical, psychological, and social factors in patient care.	Sunkersing et al. 2024, Perumal et al. 2023, Berger et al. 2021
The future directions	Family physicians must adapt to evolving evidence and contribute to research and education.	Bachmeier & Akker 2023, Schrimpf et al. 2022, Wise 2020

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