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Research Article

Polish and Slovak electronic health care (eHealth)

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Abstract – Electronic health care (eHealth) can be described as an efficient and secure way of using information and communication technologies with the use of various applications, computers, mobile devices to provide healthcare, increasing the quality of life, and contributing to the creation of financial savings in the healthcare sector. The National Health Information Centre (NCZI) is responsible for the implementation of informatization and computerization of health care in the Slovak Republic (SR). The founder of the NCZI is the Ministry of Health of the Slovak Republic. In the SR, the eHealth system with the following functions has been implemented since 1 January 2018: a) ePN, b) electronic services related to the birth of a child, c) connection to the system, d) electronic patient health record, e) eExamination, f) eOrder, g) Patient summary, h) electronic vaccination record, ch) My eHealth application, i) eAlerts, j) eLab, and also k) ePrescription. The implementation of eHealth in Poland is the responsibility of the Ministry of Health and the Center for Health Information Systems established by it. The following functions of the e-health system have been implemented in Poland: a) Internet Patient Account, b) Electronic prescription, c) Electronic issuance of sick leave certificate (e-zwolnienie), d) Electronic referral for health services (e-skierowanie), e) Teleconsultation, f) Electronic patient appointment service (e-kolejka), g) Electronic health records [4, 6, 7, 9, 20]. The aim of the article is to report the state of eHealth in Poland and Slovakia, to describe various functions and, based on available studies, to describe patients' opinions on the introduction of e-prescribing.

Keywords – Electronic health care, Poland, Slovakia, The Center for Health Information Systems, The National Health Information Centre

I. INTRODUCTION

The eHealth system introduced in the Slovak Republic is a central repository of patients' health records. The aim of the introduction of eHealth is to use information and communication technologies to provide the right health information at the right time in the right place, to improve the quality of healthcare provided, to improve the quality of life of patients and to contribute to financial savings in the healthcare sector. The National Health Information Centre is in charge of the electronic health care in the Slovak Republic. Its founder is the Ministry of Health of the Slovak Republic. The Slovak Republic's health electronics is regulated by the Act of the National Council of the Slovak Republic No. 153/2013 Coll. on the National Health Information System [6, 7, 9].

Since 1 January 2018, the eHealth system with the following functions has been implemented in the Slovak Republic: a) ePN, b) Electronic services relating to the birth of a child, c) Connecting the System, d) Patient´s electronic health record, e) eExamination, f) eBooking, g) Patient Summary, h) Electronic record of vaccination, ch) The application Moje ezdravie, i) eAlerts, j) eLab and also k) ePrescription [6].

The Electronic Temporary Disability Certificate (ePN) service is a collaborative project between The National Health Information Centre (NCZI) and the Social Insurance Institution. The electronic service was launched on 01.06.2022. Electronic services related to the birth of a child are used by the parents of the child but also by doctors. The services include the computerisation of birth reports to the NCZI, the registration of the certificate for the childbirth allowance and the reporting of agreements for the provision of general health care to newborns. The electronic recording of a laboratory test result (eLab) allows you to create a record of the laboratory test result for the physician. It contains information about the laboratory requisition and the relevant sample. The electronic record of vaccination service contains records of vaccinations and records of any adverse effects of vaccinations in a particular patient. The patient summary service provides the healthcare professional with basic information about the patient's health status, including the patient's contact details and the patient's clinical data. The eBooking service allows patients to make an appointment via the internet to see a doctor for an examination during his/her additional office hours, or to create a request for an appointment during the office hours of the outpatient clinic. This service can be set up and used voluntarily by physicians. The eExamination service involves the creation of an electronic record of the examination, which becomes part of the eHealth system. The ePrescription service includes electronic prescribing and dispensing of medicines, medical devices and dietetic foods. It improves the efficiency and safety of patient treatment. It also allows for the control of drug interactions and also the control of possible duplications in medicines. Patient´s electronic health record is patient´s health documentation in electronic form. The Connecting the System service involves secure authentication of the patient and healthcare professional to the eHealth system (the National Health Information System). Patients use an ID card with an electronic chip to identify themselves and to enter the eHealth system. Health workers use an electronic health worker card for identification and entry into the system [8, 10, 11, 12, 13, 14, 15, 16, 17, 18].

The implementation of eHealth in Poland is the responsibility of the Ministry of Health (Ministerstwo Zdrowia) and the Center for Health Information Systems (Centrum Systemów Informacyjnych Ochrony Zdrowia (CSIOZ)) established by it. CSIOZ participates in building the information society and monitors planned, built and operated ICT systems at regional and central level [4].

In Poland, the following functions of the eHealth system are implemented: a) Internet Patient Account (IKP) (Internetowe Konto Pacjenta - IKP), b) Electronic prescription (e-recepta), c) Electronic issuance of sick leave certificate (e-zwolnienie), d) Electronic referral for health services (e-skierowanie), e) Teleconsultation (Teleporady), f) Electronic appointment service (e-kolejka), g) Electronic health records, information on treatment appointments (Elektroniczna dokumentacja medyczna) [20].

An Internet Patient Account (IPA) (Internetowe Konto Pacjenta – IKP) is an account that allows a patient to collect, store, and provide access to his or her health information to the account holder or other authorized person. IKP provides access to data from multiple, previously dispersed sources. Electronic prescription (Elektroniczna recepta, e-recepta) - in May 2018, the first electronic prescription was issued under a pilot programme, but only from 8 January 2020 doctors are obliged to prescribe medicines via electronic prescriptions. They are sent via text message, email, or to the patient's mailbox. Electronic issuance of sick leave certificate (Elektroniczne zwolnienie, e-zwolnienie) - was introduced on 1 January 2016 and was used together with the paper form, but since 1 December 2018 only the electronic form of sick leave is valid in Poland, whereby the sick leave certificate is automatically delivered to the employer and the Social Insurance Institution. Electronic referral to a doctor for a health service (Elektroniczne skierowanie, e-skierowanie) - using the assigned SMS code, the patient can easily make an appointment for an examination and the advantage is that the electronic referral cannot be

lost. Teleconsultations (Teleporady) - health services provided remotely using information and communication technologies. This service has made it easier to access consultations with doctors and has also reduced the risk of transmission of infectious diseases. Service of electronic patient appointment (Informator o terminach leczenia, e-kolejka) - the service enables electronic appointment for examination, monitoring of the waiting list for a given health service and a method of identification and authentication of the ordered patients. Electronic medical documentation, electronic health records (Elektroniczna dokumentacja medyczna) - these are documents containing patients' medical data created in electronic form and containing appropriate electronic signatures [20].

The eRecept system of the Czech Republic (ČR) has joined the cross-border exchange of electronic prescriptions (eRp) with Poland from 12 June 2023. Upon presentation of patient identification documents and an eRp identifier, the pharmacist in Poland will connect with the Czech eRecept system to verify the patient's identity and the validity of the eRp. The pharmacist receives through the system information on prescribed medicines (dosage form, quantity, dosage) in his/her official language, Polish. The pharmacist in Poland will also have access to the original Czech eRp. Once the medicine has been dispensed to the patient, the dispensing information will be sent to the Czech Republic and displayed in the patient's medication record [24].

National activities in the field of e-Health include, for example, the creation of an e-Health Programme (e-Health Programme), which includes, among other things, the development and updating of a strategy document for the development of e-Health in Poland, the development and updating of an action plan for the implementation of the e-Health Programme and the coordination of its implementation, and the coordination of issues related to telemedicine [4].

II. Materials and Method

This review article discusses eHealth functions introduced in Poland and in the Slovak Republic with the focus on the patient medication record and electronic prescribing. Multiple searches of electronic databases (PubMed, Web of Science, Wiley Online Library, Springer) were performed using various keywords such as "Polish eHealth", "Slovak eHealth", "eHealth functionalities", "electronic prescription", "Patients' opinions on eHealth", "advantages of eHealth", "disadvantages of eHealth", "eHealth systems security", in order to identify relevant key documents and studies. Information was also searched through the websites of official state institutions (Ministry of Health of the Slovak Republic, National Health Information Centre, Ministerstwo zdrowia, Centrum Systemów Informacyjnych Ochrony Zdrowia, Státní ústav pro kontrolu léčiv).

III. Results

Patient's medication record in Poland

Access to a patient's medical records and information about their medication history is very valuable information for pharmacists, as patients often do not remember the names of their medications or give pharmacists inaccurate names and dosages. The electronization of healthcare in Poland, the introduction of the e-prescription function and the computerization of other health services allows for the collection of a larger part of the patient's health data in the patient's online account [2].

Patients in Poland can give the pharmacist the opportunity to consult their medical records (EDM - elektroniczna dokumentacja medyczna. They can give access to a specific pharmacist or a specific pharmacy for a selected period of time, for a specific type and scope of accessed health data. In order to use this eHealth service, the patient must have an Internet patient account (IKP). Pharmacists access the online patient account to obtain information about the medicines they are taking and can then provide individualised expert advice on, for example, potential drug interactions, potential side effects of medicines taken by a particular patient, information on the correct storage of medicines, or information on the availability of a cheaper substitute for a prescribed medicine. The online patient account collects electronic prescriptions and records of paper prescriptions filled since January 2019 [2, 21, 22, 23].

The reason for the introduction of this eHealth feature is mainly due to the planned introduction of pharmaceutical care as a paid benefit in pharmacies [2].

Electronic prescription

In May 2018, the Ministry of Health and the Centre for Health Information Systems (Centrum Systemów Informacyjnych Ochrony Zdrowia CSIOZ) started intensive preparations for the implementation of digital health services. The electronic prescription service was the first to be put into practice. In December 2018, all pharmacies were connected to the e-health system. The obligation to issue and dispense prescriptions electronically came into force on 8 January 2020. This means that doctors in Poland are obliged to prescribe medicines by e-prescription from 8 January 2020 [1, 26].

Doctors in Poland are obliged to prescribe medicines via e-prescription from 8 January 2020. From May 2020 to January 2021, Wrzosek, Zimmermann, and Balwicki (2021) conducted a questionnaire survey in Poland to determine patients' views on the use of electronic prescriptions in practice. They obtained 456 (100%) responses, with 345 (75, 7%) patients being female. Most of the respondents in that study were under 30 years of age (41.9%). 448 (98%) respondents were familiar with the term e-prescription. Only 8 patients did not know the term. Most patients were more comfortable with an electronic prescription (323; 72.1%) compared to a paper prescription. Respondents justified their opinion, for example, by the fact that an e-prescription eliminates the risk of losing it and that in certain cases a doctor's visit is not necessary to prescribe an e-prescription. Among the benefits of introducing e-prescribing into practice, respondents included, for example a) electronic prescriptions are convenient, b) no risk of losing, damaging prescriptions, c) electronic prescriptions are environmentally friendly, d) no prescription illegibility problem, e) reduced risk of prescription errors. Only 25 (5.6%) respondents were comfortable with a paper prescription. Among the justifications given were that respondents felt that the paper form of prescription allows for greater control over prescribed medicines, easier access to a list of prescribed medicines and is more convenient for older people who do not have experience of working with information and communication technologies. The form of prescribing was not important for 108 (22.3%) respondents. Polish patients comprehensively evaluated the introduction of electronic pre-prescription and the possibility to obtain an electronic prescription, for long-term medicines without a personal visit to the doctor, positively. The research showed that the most used method of receiving electronic prescriptions in Poland was sending them via SMS messages (254; 55.7%). In addition to this option, electronic prescriptions were sent to patients in the form of printouts with a barcode (printout with a barcode), by mail (email). Another way was that the physician provided the e-prescription code to the patient in verbal form during the online consultation. The majority of respondents had no safety concerns about the use of electronic prescriptions [26].

A similar study by Štempeľová et al. (2021) focused on the opinions of patients on the introduction of e-health functionalities was conducted in the Slovak Republic between December 10, 2020 and January 10, 2021. A total of 152 patients (100%) participated in the questionnaire survey, 107 (70.4%) were female and 45 (29.6%) were male. The most represented age group in the above study was patients aged 18-30 years (78; 51.3%). The term electronic health (eHealth) was known by most of the respondents (125; 82.2%) and most of them (99; 65.1%) would define this term as the connection of health professionals (doctors, pharmacists) through technology. The ePrescription service was the most used eHealth service from the patients' perspective (141; 92.8%). The majority of patients surveyed (144; 94.7%) were satisfied with the introduction of ePrescriptions and considered dispensing through ePrescriptions to be faster (132; 86.8%). However, the majority of respondents (88; 57.9%) did not think that dispensing medications via e-prescriptions gave pharmacists more time to provide professional information and communicate with patients. The biggest advantage (133; 87.5%) of e-prescribing from the patients' perspective was that when prescribing long-term chronic medications, it was sufficient to communicate with the physician by telephone or e-mail, and a personal visit to the physician's office was not always necessary. Among the disadvantages of e-prescribing, respondents identified the situation when the doctor forgets to prescribe the e-prescription (66; 43.4%) or prescribes it incorrectly (27; 17.8%) [25].

IV. DISCUSSION

In both studies (1. Wrzosek, Zimmermann, Balwicki (2021), 2. Štempeľová et al. (2021)) aimed at investigating patients' views on the introduction of e-health into practice, the first of which was conducted in Poland and the second in the Slovak Republic, the largest part of respondents were women under 30 years of age. The majority of respondents in the Polish study were familiar with the term ePrescription and similarly the majority of Slovak respondents were familiar with the term eHealth. ePrescription was preferred to paper prescription by the majority of Polish respondents. The majority of participating Slovak patients were satisfied with the introduction of ePrescriptions, they were comfortable with them and the respondents considered the dispensing of medicines via ePrescriptions to be faster. Among the advantages of introducing electronic prescribing into practice, Polish respondents included, for example, that a) electronic prescriptions are convenient, b) no risk of losing, damaging prescriptions, c) electronic prescriptions are environmentally friendly, d) no prescription illegibility problem, e) reduced risk of prescription errors. Slovak respondents considered the biggest advantage of electronic prescribing to be the fact that when prescribing long-term chronic medications, it was sufficient to communicate with the doctor by phone or e-mail, while a personal visit to the doctor's office was not always necessary [25, 26].

Most respondents of the study by Štempeľová et al. (2021) defined the term eHealth as the connection of health professionals (doctors, pharmacists) through technology. Other responses included: the provision of an electronic repository as the source of all patient health information and the use of information, communication technologies and digital tools in healthcare. The ePrescription service was the most used eHealth service from the patients' perspective. In addition to this service, patients also used the following functionalities: eBooking, the application My eHealth, Patient's electronic health record, and eExamination. The biggest advantage of ePrescribing for patients was the fact that in certain cases, such as the prescription of long-term chronic medication, it was not necessary to visit the doctor's office. Patients also mentioned other advantages of e-prescribing: environmentally friendly, saving paper, the fact that the patient only needs an insurance card or an eID card with an electronic chip to collect the prescribed medication, no need to deal with illegible doctor's handwriting, loss or damage of the paper prescription, lower risk of forged prescriptions. Disadvantages of e-prescribing included situations where the doctor forgot to prescribe the e-prescription or prescribed it incorrectly [25].

V. CONCLUSION

The COVID-19 pandemic has accelerated the development of eHealth services in Poland. According to a study by Płaciszewski (2022), e-prescription and e-referral to a physician for health services (Elektroniczne skierowanie (e-skierowanie)) were among the most frequently used e-health services in Poland. According to the study by Štempelová et al. (2021), the most used eHealth service in the Slovak Republic was the ePrescription service. According to a study by Lapane et al. (2007), patients who were prescribed medications via electronic prescriptions were more likely to be interested and informed about the importance of medication adherence. A Polish patient, through the e-prescription service, always gets the medicine prescribed by the doctor, there is no problem to read the text of the e-prescription, the patient does not lose the e-prescription because it is stored in the patient's online account. Chronically ill patients can request another e-prescription through eHealth services without visiting the treating doctor's office in person. Electronic prescribing is another element of the digitization not only of healthcare but also of the documentation of the patient's diagnostic and therapeutic process [3, 20, 25].

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