



# E-health in patients' opinions

## E-zdrowie w opinii pacjentów

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A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation,

D – Writing the article, E – Critical revision of the article, F – Final approval of article

Mirośławska D, Popowski P, Pędziński B. E-health in patients' opinion. Med Og Nauk Zdr. doi: 10.26444/monz/128244

### Abstract

**Objective.** Acceptance by patients of new solutions and functionality in e-health exerts an effect on the effectiveness of their implementation. The main aim of the study was the recognition of the opinions of patients concerning the selected issues pertaining to e-health.

**Materials and method.** From the questionnaire developed by the 'We Patients' foundation, items were selected pertaining to use of e-health instruments and functional needs of the system of drug information system, access to medical records, and engagement of professionals in the sphere of access to drug information. A non-random group of adult males and females was examined selected from among the population of patients from two centres, an urban centre – Centre of Family Medicine GUMed in Gdańsk, and a rural centre – Kaszuby Region Medical Centre in Sierakowicach. Anonymous answers were provided by 200 respondents – 100 from the urban centre (Gdańsk), and 100 from a rural centre (Sierakowice).

**Results.** Patients express their definite willingness to use e-health instruments. The frequency of using the Internet for purposes related with health was related with age ( $\chi^2=30.65$ ;  $p<0.05$ ); education ( $\chi^2=37.53$ ;  $p<0.001$ ) and place of residence (with this respect only from the aspect of using the Internet for purposes connected with e-health  $\chi^2=14.70$ ;  $p<0.01$ , and especially with signing-up for a visit to a physician  $\chi^2=9.65$ ;  $p<0.01$ , and obtaining the results of laboratory tests  $\chi^2=5.27$ ;  $p<0.05$ ). In addition, patients were interested in the safety of their medical records, and would like to be able to decide which professionals should be entrusted with the data on their drug information.

**Conclusions.** The majority of patients declared themselves to be prepared for the changes introduced, await these changes, and also perceive the potential benefits coming from the implementation of new technologies.

### Key words

e-health, patient opinion, e-prescription, e-referral, safety of medical records

### Streszczenie

**Cel pracy.** E-zdrowie jest obszarem, w którym dokonuje się w Polsce wielu istotnych zmian. Akceptacja nowych funkcjonalności przez pacjentów wpływa na skuteczność ich implementacji. Celem głównym pracy było poznanie opinii pacjentów dotyczących wybranych kwestii dotyczących e-zdrowia.

**Materiał i metody.** Z kwestionariusza ankiety opracowanego przez fundację My Pacjenci wyselekcjonowano pytania dotyczące: korzystania z narzędzi e-zdrowia, potrzeb funkcjonalnych systemu informacji lekowej, udostępniania danych medycznych oraz zaangażowania profesjonalistów w sferę dostępu do informacji lekowej. Przebadano nielosową (przypadkową) grupę dorosłych kobiet oraz mężczyzn, na którą składali się pacjenci dwóch ośrodków – ośrodka miejskiego (Centrum Medycyny Rodzinnej GUMed w Gdańsku) oraz ośrodka wiejskiego (Kaszubskie Centrum Medyczne w Sierakowicach). Anonimowych odpowiedzi udzieliło 200 osób.

**Wyniki.** Pacjenci w większości wyrażają zdecydowaną chęć korzystania z narzędzi e-zdrowia. Częstość korzystania z Internetu w celach związanych z ochroną zdrowia była powiązana z wiekiem ( $\chi^2=30,65$ ;  $p<0,05$ ); wykształceniem ( $\chi^2=37,53$ ;  $p<0,001$ ) i miejscem zamieszkania (w tym zakresie jedynie w aspekcie korzystania z Internetu w celach związanych z e-zdrowiem  $\chi^2=14,70$ ;  $p<0,01$ , a szczególnie z zapisywaniem się na wizytę do lekarza  $\chi^2=9,65$ ;  $p<0,01$  oraz z pozyskiwaniem wyników z laboratorium  $\chi^2=5,27$ ;  $p<0,05$ ). Pacjenci wykazywali zainteresowanie bezpieczeństwem swoich danych medycznych oraz chcieliby móc decydować, którym profesjonalistom powierzą dane dotyczące informacji lekowej.

**Wnioski.** Pacjenci w większości deklarują przygotowanie do wprowadzanych zmian, oczekują ich, a także dostrzegają potencjalne korzyści płynące z wdrażania nowych technologii.

### Słowa kluczowe

e-zdrowie, opinia pacjentów, e-recepta, e-skierowanie, bezpieczeństwo danych medycznych

### INTRODUCTION

Many changes are taking place in Poland in the area of e-health. The aim of the solutions introduced is to bring benefits to patients, the system and its staff [1]. From 8 January 2020, there is an obligation to issue prescriptions in electronic

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Received: 15.05.2020; accepted: 08.10.2020; first published: 03.11.2020

form [2–4], and from 8 January 2021, a similar obligation will apply to referrals [5, 6]. The aim of the introduced solutions is to provide benefits to patients, to the system and its employees.

Implementation of information technology systems in health care is a difficult and complex undertaking, in which the consideration of opinions of the users seems to be crucial for successful implementation of the process [7–8]. In 2016, the World Health Organization (WHO) published the *WHO Global Strategy on People-centred and Integrated Health Services 2016–2026* [9], which contains wording such as 'person-centred care'. This means an approach to care which consciously adopts the perspective of a person and responds to this person's needs in an overall way. Person-centred care should be focused around people's health needs and expectations, and more rarely their diseases. The patient's experience as a part of discussions about changes in the health care system, may play an important function. In a systematic review of 55 studies, a positive correlation was confirmed between the patients' experiences and their safety and clinical effectiveness measured in many disease entities [10]. There is also evidence for positive relationships between patient experience and measurements of the technical quality of care and undesirable events [10].

## OBJECTIVE

The main aim of the study was recognition of patients' opinions concerning selected issues in e-health. The following to use or use of e-health instruments between the distinguished groups differing with respect to the place of residence, age, education, and health status; analysis of the functional needs of the system concerning drug information; examination of the opinions pertaining to preferences related with the safety of medical records; and investigation of opinions concerning the engagement of professionals in the sphere of access to drug information. A deficit of information was observed concerning the proper quality in the analysed problem. The collected data could be of use in comprehensive scientific studies, and for analytical and implementation purposes [11].

## MATERIALS AND METHOD

The assumption of the conducted study was recognition of patients' opinions concerning the solutions offered by the implementation of the functionality of e-health. It was assumed that there are differences in opinions of individual respondents with respect to their place of residence, age, education, and state of health. In order to recognize respondents' attitudes, a questionnaire developed in 2018 during realization of the project 'Together for Health' by the 'We Patients' Foundation was adjusted to the need for collecting information personally in two outpatient departments: Centre of Family Medicine at the Medical University in Gdańsk, a Primary Health Care Outpatient Department (an urban centre), and the Kaszuby Medical Centre in Sierakowice, a Primary Health Care Outpatient Department and specialist consultation rooms (a rural centre) [12]. The study was carried out within five days during the period December 2018 – March 2019, and included a total number of 200 respondents (100 from each centre) who anonymously provided replies to 17 questions.

11 questionnaires were rejected due to incompleteness of answers. The questions concerned three thematic areas: 1) use of e-health tools and functional needs of the drug information system; 2) access to medical records; 3) engagement of professionals in the sphere of access to drug information.

The study group was selected by non-random sampling (occasional) [13]. The study included males and females who declared their age within six intervals: under 20; 20–30; 31–40, 41–50, 51–60, and over 60. Participation in the study was voluntary and proposed to randomly selected persons who reported to the outpatient department on days and hours of routinely provided health services. Each respondent was asked directly, personally, to complete the questionnaire during their visit to the department. The patients could choose one of the two forms of providing the answer: by the Paper&Pen Personal Interview method (PAPI) or independent completion (Computer Assisted Web Interview) using a tablet made available to the respondent. Statistical analysis of results was performed using the software StatSoft STATISTICA v. 13.3. Opinions were analysed expressed in the three above-mentioned thematic areas, concerning such parameters as: gender, age, place of residence, education, and the state of health. A non-parametric test was used in order to investigate the relationship between two variables measured by the quality scale –  $\chi^2$  test for independence. In the case of obtaining a statistically significant result (level of significance  $p < 0.05$ ), null hypothesis was rejected in favour of the alternative hypothesis concerning the occurrence of the relationship between two variables.

## RESULTS

The questionnaire was conducted in a group of 200 respondents (N=200), 75% of females and 25% of males; the majority aged 20–30 (35%), followed by 31–40 (21%), and a considerable group were patients aged over 60 (16%). According to education, there dominated respondents with secondary school education (43%), followed by those with higher education (38%), vocational education (16%), and primary or junior high education level (3%). As many as 51% of respondents were rural inhabitants, 39% lived in large cities (population over 200,000 inhabitants) 39%, and the remainder were inhabitants of small towns. A half of the respondents admitted that they felt healthy; 28% mentioned that they felt completely health, although they had certain health problems. Constant or periodical health problems were reported by 19% of respondents, whereas 3% felt sick and were suffering.

With respect to the use of e-health tools and functional needs of the system of drug information, within the last 12 months, 62% of respondents used the Internet in any domain related with health care; 9% reported that they would willingly use such an opportunity, and 22% admitted that they did not feel such a need. It was confirmed that the frequency of using the Internet for purposes related with health care was related with age ( $\chi^2=30.65$ ;  $p < 0.05$ ), and education level ( $\chi^2=37.53$ ;  $p < 0.001$ ). Persons aged 41–50 (82%) most frequently used the Internet for health -related purposes, while it was most rarely used by those aged over 60 (30%), and under 20 (56%) (Fig. 1). According to education, respondents with higher education most often used the Internet for purposes related with health care (81%), followed by those with secondary education (59%) (Fig. 2).

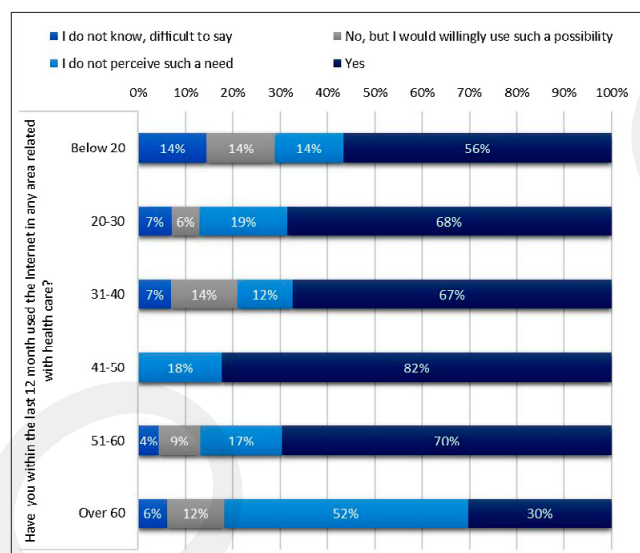


Figure 1. Use of the Internet in the areas related with health care according to age.

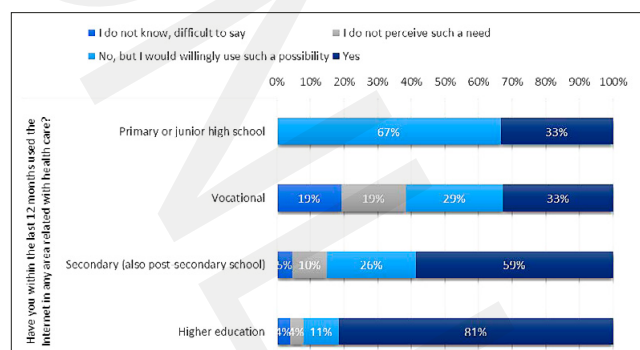


Figure 2. Use of the Internet in the area related with health care according to education

The respondents would most willingly use registration for a visit to a physician, nurse, or other medical profession (94%), obtaining the results of laboratory tests (61%), seeking an outpatient, hospital, or consultation room (67%), and seeking opinions about physicians, nurses, and other medical professionals (50%). Place of residence was related only with the use of the Internet for purposes connected with e-health ( $\chi^2=14.70$ ;  $p<0.01$ ), and especially with signing-up for a visit to a physician ( $\chi^2=9.65$ ;  $p<0.01$ ), and obtaining the results of tests from a laboratory ( $\chi^2=5.27$ ;  $p<0.05$ ). Respondents living in urban areas more often used the Internet within the last 12 months in any of the domains related with health care, and also more often made an appointment for a visit to a physician through the Internet, and obtained the results of tests electronically. The results of the remaining analyses were statistically insignificant.

The subsequent issue dealt with in the questionnaire concerned the functional needs of the system concerning drug information. According to the results obtained, the patients would willingly use the possibility of generating substitutes (84%) and prolongation of prescriptions (91%). They would like the system to inform them (94%) and their physician (90%) concerning the problem that the prescribed drugs enter into interactions with other drugs taken. Also, the patients would like it if, in the case of a breakdown in access to the system, there was still a possibility to purchase drugs with reimbursement (94%). Less often, the patients

mentioned the need for a printout from the system of current drug list, together with the dosage (88%), and willingness to receive notifications about running-out of the supply of a drug (87%). In addition, 79% of patients would like to obtain drugs from one pharmacy of their own choice. As many as 91% of respondents reported that they would like to obtain drugs from any pharmacy in Poland. The option of supplying drugs to the door enjoyed less popularity, and would be used by 61% of respondents; 65% would like to possess a monitoring device checking life parameters for the purpose of assessment of the effectiveness of the drugs applied. With respect to the method of providing information about accessibility of drugs, two options obtained an equal number of replies: through a web browser, and in each pharmacy through a pharmacist – 55% each. A telephone information line was indicated by 13% of respondents, while 1% mentioned another way of learning about the accessibility of a drug.

Concerning the problem of access to medical records, the majority of respondents admitted that they would either definitely express or rather express their consent for anonymous medical data to be used in scientific reports and epidemiological information (74%). It was confirmed that the willingness to express such consent was related with the respondents' state of health ( $\chi^2=22.53$ ;  $p<0.05$ ) – most frequently those ill and suffering agreed to the use of anonymous medical data in scientific reports and epidemiological information. Also, the majority of respondents considered that definitely or rather should exist an electronic system which collects information about all prescription drugs applied to a patient (80%). The respondents rather agreed that they would like to decide who can have access to the information about all drugs they take (72%), they would also wish to have the possibility to change their decision about who can access their information concerning drugs (72%), and would like to check who and when information about the drugs they take is reviewed (72%).

According to respondents, the PHC physician should have the greatest access to information about all prescribed drugs (92%), followed by a specialist physician (70%). Only 18% of respondents would grant access to a nurse; 24% would make data available to a pharmacist working in a pharmacy where drugs are purchased. As many as 54% of patients indicated themselves as those who have access to this knowledge, and 34% – the persons to whom medical records are made available; 7% of respondents would grant such access to the National Healthy Fund, and 3% to the Ministry of Health. The respondents would more willingly provide access to information concerning prescribed drugs, than the drugs which they purchased. With respect to access to information concerning all drugs purchased on prescription, most often the patients would grant an access to a family physician (72%). Secondly, they considered that only they should possess knowledge concerning drugs purchased on prescription; 49% of respondents indicated a specialist physician, 9% a nurse, and 17% a pharmacist; 7% the National Health Fund, and 3% the Ministry of Health. In respondents' opinions about the possibility of being informed about the occurrence of hazardous interactions between drugs: the physician while prescribing the drug (88%), the patient (66%), and a pharmacist while dispensing the drug (50%). More rarely, the respondents mentioned other physicians (36%), persons authorized by the patient (20%), and a nurse (14%).

## DISCUSSION

The number of solutions offered in the area of e-health is constantly increasing. In the context of using the Internet, the results of own study are close to those obtained by the foundation We Patients, in survey including a group of 1,233 people; 75% of respondents used the Internet for purposes related with health, and only 7% did not perceive such a need. The Internet was most frequently used for seeking an outpatient department, hospital or consultation room, and opinions about physicians and health care facilities – 83% and 73% of respondents, respectively. According to Eurostat, in 2018 in Poland, the percentage of people aged 16–74 using the Internet for purposes related with health was 48%. An upward tendency may be observed starting from 2005 when this percentage was only 7% [14]. In the discussed area, a study was also conducted which is a part of an international project eHealth Trends (WHO/European survey on eHealth consumer trends), in which seven European countries participated. In Poland, the study was conducted by the Public Opinion Research Centre TNS-OBOP in a randomly selected representative group of 1,000 Polish inhabitants aged 15–80. The study showed that 533 respondents were users of the Internet, which is 53.3% of the total population examined. Only 29 from among 533 respondents reported that through the Internet they made contact with a family physician or other specialist [15]. The subsequent study demonstrating the use of the Internet was carried out among students of extramural study in Management at Lublin University of Technology in 2013, in a group of 47 respondents. 59.6% used the Internet for the purpose of using consultations by other patients; 48.9% sought opinions about health facilities and physicians; 38.3% picked-up test results, and 9.1% sought information about a treatment method [16].

Concerning the use of the Internet by the elderly, the results were as follows: in the study of October 2015 carried out in a group of 150 respondents, only 27% of those aged over 60 used the Internet [17], which is the level close to the result of own study (30%). In another study conducted in 2015 in a group of 170 patients, interest in use of the Internet those aged over 60 was very low – 10.5% [18]. In turn, according to a study carried out in The Netherlands among 1,014 respondents aged between 57–77, the elderly were open to the use of new technologies, and 63% of older respondents would use functionality of e-health with a high or relatively high probability [19]. It is an interesting fact that persons with a lower education level were less willing to use modern solutions, which is similar to the results of own study.

Considering the issue of the safety of medical records, in the study 'E-health. What do the patients expect?' 96% of respondents would like to be able to find out who and when reviewed information about the drugs applied. Also, 96% of respondents would like to have an opportunity to change their decision concerning who can have an access to information concerning the applied drugs, and the possibility to check by whom and when information about the drugs applied was reviewed. The issue of privacy and safety of personal data was not a matter of concern of those who used of the Internet for health-related purposes. Only 6.3% of respondents expressed concern about the confidentiality of information provided [15]. The differences in perception of access to medical records – 6.3% within the project eHealth Trends (2007), 96% in the results of the study 'E-health.

What do the patients expect?' (2017), and 72% in own study (2018–2019), may result from the introduction in 2018 of statutory changes aimed at the management of the safety of personal data [20], which were publicized, and caused an increase in interest in this problem.

An important problem is also willingness to grant access to drug information to specialists in various medical professions. According to the study 'E-health. What do the patients expect?' access to all prescribed drugs on prescription should have: PHC physician (85%), patient (85%), specialist physician (77%), persons to whom medical records were made available (55%), pharmacist (24%), nurse (19%), the National Health Fund (10%), and the Ministry of Health (7%). While providing the reply to the question about access to all drugs purchased on prescription, the patients indicated: firstly, themselves (79%), the PHC physician (64%), a specialist physician (55%), persons to whom medical records were made available (37%), pharmacist (18%), nurse (12%), the National Health Fund (9%), and the Ministry of Health (6%). With respect to providing information by the system concerning the occurrence of hazardous interactions between drugs the patients indicated that the alert should be received by: a physician while prescribing the drug (89%), the patient (83%), pharmacist while dispensing the drug (55%), other physicians who provide care for the patient (55%), persons to whom medical records were made available (22%), and nurse (15%).

Considering the presented results, both according to own study and the 'We Patients' Foundation, a relatively low percentage of positive answers were obtained by professions such as nurse and pharmacist. This might have been due to the perception, during the period and place of the conducted study, of the scope of competences of the above-mentioned professions in the situation when nurses did not yet issue prescriptions. However, in a systematic review focused on the problem of the image of a nurse, according to patients in conservative treatment wards, among the members of the therapeutic team, the nurse is the person best prepared for the provision of care (42.7%). In turn, in the opinions of patients in surgical wards, the physician is the best prepared person (63.7%), while the nurse occupies the second position (22.3%). In the opinions of older patients, the professional position of nurses, compared to other medical professions, such as physician, rehabilitation specialist, or paramedic, is mainly on a medium level (approx. 60% of respondents), and a high level (approx. 20% of respondents). Adolescents also perceive the position of the nursing profession to be at a medium or high level. Nurses expressing their opinions concerning own image perceived their position as medium (47.9%), or low (25.4%) [21]. Among 181 occupationally active nurses, 66.3% considered that the media negatively create their image. In the opinions of physicians, nurses were less positively perceived from the aspect of professional and interpersonal traits. It is an important fact that, according to studies, research and social activity of nurses should exert a positive effect on the improvement of the image [21]. In a study carried out in a group of 107 adult patients at the Provincial Polyclinical Hospital and in primary health care in Toruń, Poland, the opinions of society concerning the image of nurses were positive. Among the respondents, not a single person was found who would not have confidence in nurses. Respondents from urban areas considered the nurse as a trustworthy person to a greater degree than respondents living in rural areas [22].

With respect to pharmaceutical care, it faces many problems which may exert an effect on the perception of the profession of a pharmacist in society. One of these problems is the attitude of pharmacists towards the collection and use of drug information – 49% of them did not show any interest in the collection of information about drugs used by a patient, and 38.5% considered that the persons authorized to solving drug problems are exclusively physicians. The subsequent problem is that pharmacists possessing a Master degree are burdened with duties, and cannot effectively devote their time to patients. In addition, there is rarely a separate place in the pharmacy where a pharmacist could interview a patient in conditions which would be comfortable for both parties.

The necessity to obtain a patient's consent to the processing of personal data and data concerning the state of health is also important. In the situation of the presence of many pharmacies, from among which the patient can freely chose, there is a high probability of data dispersion. The response to this problem may be e-health tools providing overall information about the medical history of a patient. The relationship between pharmacists and physicians is also important. Nearly a half of pharmacists do not establish cooperation with physicians, and the remainder establish it sporadically. Another study quoted in the article concerns the problem of the expectations of physicians towards pharmacists. According to this study, the longer the physician performed the profession, the lower the demands set to a pharmacist [23]. In addition, communication between physicians and pharmacists is frequently unilateral, and the problems undertaken are usually formal and not substantial issues. This state of affairs does not have to result from the lack of competences of pharmacists, but, e.g. from the lack of complete knowledge about a patient and the therapies applied [24]. All the above-mentioned aspects may affect the opinions of patients concerning the profession of a pharmacist, and result in the lack of willingness to entrust to them with health information.

The basic limitation of the study was that the selection of respondents was non-random (occasional; hence, there is no possibility to generalize the results obtained on the general population. The replies were provided by occasional persons using health services in two outpatients clinics who expressed their consent to participate in the survey. In addition, the number of respondents was small, which additionally limited the possibility to refer the conclusions from this sample on the general population. Despite these serious limitations, the study provides important information about relationships concerning the opinions of patients pertaining to e-health, which may be verified in a random study of an all-Polish population.

The article was submitted for publication during the pandemic of COVID-19. Legislative changes introduced in connection with the pandemic, e.g. access and financing of tele-consultations, introduction and promotion of ProteGO Safe and IKP, show that the legislator saw the necessity and also the benefits resulting from the use of e-health solutions [25]. It seems that the COVID-19 outbreak can significantly change patients' perception of using e-health [26, 27].

## CONCLUSIONS

Many changes taking place in the area of e-health are aimed at improvement of the efficacy of the functioning of the health care system. Studies of opinions of patients (persons) seem to be an inseparable element for the improvement of the quality and safety. They are recipients of medical services who may, from their own perspective, indicate areas which require changes. The conducted study shows that in some aspects the use of e-health instruments is related with age, education, and place of residence. The respondents also expressed their opinions concerning aspects of sharing medical data, and engagement of professionals in the sphere of access to drug information. Taking into account the results of the presented study, it can be concluded that patients are mostly prepared for the introduced changes, expect them, and see the benefits of implementing new technologies.

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