

# Online Patient Account: A Tool to Support Older Adults or Digital Exclusion?

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**Abstract:** One of the conditions for the efficient operation of the healthcare system in Poland is the well-functioning information system, which for several years, has been moving towards full computerization. The application of new technologies in serving older adults is aimed at ensuring safety and extending and increasing their independence. The Online Patient Account (Internetowe Konto Pacjenta - IKP) is an electronic application in Poland that any patient can log in to view their health history free of charge. The aim of the present paper is to answer the question of whether the introduction of the Online Patient Account service in Poland leads to the elimination of barriers related to the dysfunction of the healthcare system, or to the secondary exclusion of older adults. The study used a diagnostic survey method based on a questionnaire technique that was addressed to older adults living in Poland. The survey was conducted in late 2022 and early 2023. The results obtained suggest the problem of digital exclusion of older adults, which may consequently exacerbate disparities in access to medical care. The results of the survey helped illustrate the specific situation of older adults and develop important recommendations for the inclusion of older members of society in the market of healthcare services. The research conducted shows that the IKP service, despite its potential to address inequalities in healthcare for older adults, is still in the development stage.

**Keywords:** Older adults, Digital exclusion, Society 5.0, New technology, Healthcare

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## 1. Introduction

According to the European Commission, "eHealth is the use of ICT in health products, services, and processes, combined with organisational change in healthcare systems and new skills. [...] eHealth covers the interaction between patients and health-service providers, institution-to-institution transmission of data, or peer-to-peer communication between patients and/or health professionals" (EC, 2012 ). The digital health marketplace is expected to enable the use of information and communication technologies (ICT) to maintain and improve patients' health, and contribute to improving the accessibility and quality of health care. The concept of Society 5.0 is expected to help in this field, and it is hoped that it can overcome the problem that arises in aging societies, in which an increasing number of people require additional medical care. Therefore, it is important to skillfully and fully exploit the opportunities brought by the development of ICT to acquire new knowledge and create new quality by developing relations between people and objects in the real world and virtual reality (Harayamaa, 2017 ). The purpose of the present paper is to discuss the possibility of adapting new technologies in serving older adults in the area of e-health, using the Online Patient Account as an example.

## 2. Background and Literature Review

### 2.1 Aging Society and the Concept of Society 5.0

Healthcare and the entire medical sector are going to face big challenges in the next few years. As numerous social studies indicate, in modern societies, population aging has become a problem that cannot be ignored (Almeida, Matos 2005). It is a global and universal process. According to the United Nations, for the first time in history, the number of people aged 65 and over worldwide outnumbered the number of children under 5, and by 2050, one in six people worldwide will be over 65. Furthermore, in 2019, the UN also evaluated that people aged 65 and over accounted for 9% of the world's population of global residents. The percentage is estimated to grow steadily, reaching 12% in 2030, 16% in 2050, and up to 23% in 2100, respectively. Furthermore, 2019 UN projections suggest that by 2050, one in four people in Europe and North America will be 65 or older (UN, 2019).

An aging population and low birth rates mean that the balance between the number of people of working and post-working age may be disturbed. Another problem is the increasing singularization of old age, i.e., the increase in the number of older adults who form single-person households, are on their own, and have no one to support them (according to projections by Statistics Poland (GUS), 53.3% of one-person households in Poland in 2030 will include people aged 65 and over, with 17.3% aged 80 and over). This process negatively affects the economy because it increases health and medical expenses, especially for older adults (Wiener, Tilly 2002; Bloom, Canning, Sevilla 2003; McMorro, Roeger 2004; Kotlikoff, Burns 2004; Lee, Mason 2011; and others). Polish researchers also noted that for the first time in the history of mankind, there are as many as two

generations of older adults, that is, people over 60 who still have living parents aged 80 and older (Migdał-Najman, Najman, Badowska, 2020). The demographic situation in these terms in Poland is special. According to Statistics Poland, the population of Poland in 2019 was 38.38 million, of which people aged 60 and over accounted for 25.3%, while in 2050, the percentage of people aged 60 and over will be 40.4% (GUS, 2021). According to UN projections (UN, 2019), by 2050, the number of Poles will have reduced to 33.30 million inhabitants, with 31.12% of the population over 65 years of age. According to the UN, Poles will be the world's tenth oldest society in 2050. Such an emerging demographic structure will directly generate changes in consumer market segments, with a growing role of older adult consumers. Therefore, efforts are being made around the world to improve the quality of life of older adults, especially since the problem of aging does not only affect rich but also developing countries.

The Japan Business Federation, in its 2016 document *Toward Realization of the New Economy and Society*, pointed out that the time for great reform has arrived, and that Japan, as a forerunner in finding solutions to emerging problems, is committed to promoting economy-wide and society-wide innovation (Japan Business Federation, 2016). The concept of Society 5.0 defines society as human-oriented, in which economic progress containing solutions to social issues is balanced by a system that offers high integration of digital and real space. Therefore, in recent years, there has been an increasing number of studies devoted to the use of new technologies in the care of older adults (Sixsmith 2006; Nygård, Starkhammar 2007; Robinson et al. 2009; Topo, Östlund 2009; Mountain 2013). In practice, the solution to the above problem is expected to be Society 5.0 and the 5G network, while the use of information systems and mobile technologies is expected to form the basis for a change in the approach to the management of processes in the area of decision-making in healthcare. Therefore, e-health services belong to the group of services that have the greatest potential for growth in the coming years under the conditions of the modern economy. e-health is expected to improve various aspects of healthcare (quality, efficiency, accessibility, etc.), provide consumers with better access to healthcare services and health information, and stay physically and mentally fit. This, in turn, will require digital competencies, which on the one hand, can be an enabler, and on the other hand, can be a hindrance to coping with the digital world (Harayama, 2017). The above-mentioned digital competencies become a key factor for people who faced the digital revolution at the end of their professional careers and had far less to do with new technologies than younger members of society. According to S. Serpa and C. M. Ferreira, society 5.0 is expected to "promote further development of the potential of the individual-technology relationship, and improve the quality of life for all people through a super smart society" (Serpa and Ferreira, 2018, item 1).

A survey by Statistics Poland (GUS, 2021) conducted in Poland in 2019 showed that only 34.1% of people aged 65 to 74 used computers in the past three months. Although people of this age are increasingly using computers at least once a week, the percentage of regular users remains at a lower level than in younger age groups. In 2019, 37.0% of people aged 65-74 used the Internet (CSO, 2021), 33.3% of people regularly connected to the Internet in 2019, and already in 2020, this percentage was 40.4% (CSO, 2020). On the other hand, 64.6% of those aged 65 and over have never used the Internet. Access to technology and the knowledge and ability to use new technologies can contribute to better and more open acceptance of digital solutions in the healthcare market, while limitations in this area are a major barrier to the spread of digital services. These results suggest that although more and more older adults in Poland are using the Internet, there are still large differences in access between different age groups. It is also possible that the problem is the lack of access to adequate infrastructure, and inadequate education on how to use the Internet, especially for older adults, who usually have not had contact with new technologies before.

A few years ago, a new term of 'digital divide' emerged in public discourse, meaning unequal access to new technologies (van Dijk, 2006). Digital divide can be observed both on a macro scale, in which case it manifests itself, for example, in differences in Internet access between different regions of the world, and on a micro scale, for example, when differences in media competence are observed among members of a household (Vu, 2011). A review of the literature shows that groups affected by digital divide certainly include older adults. Older adults use the Internet for a variety of reasons. In the case of e-health services, it is most often used to obtain health information, check medical recommendations, lab results, and general recommendations to improve health-related quality of life (Martin-Hammond et al., 2019, Bolle et al., 2016, Shim et al., 2018). On the one hand, using the Internet as a source of health information has many advantages, including offering quick, easy, timely, and inexpensive access to information and thus allowing you to control your health status, provided that the information is reliable. Despite the numerous benefits of e-health for older adults, many do not know how to handle the use of new technology (Santana et al., 2011).

## **2.2 Online Patient Account**

In 2011, the National Center for Health Information Systems announced a tender for an Electronic Platform for the Collection, Analysis, and Sharing of Digital Resources on Medical Events. It is one of the largest e-health projects in Poland. Online Patient Account (IKP) is a digital collection of health information. Once a person's account is authorized without leaving home, the patient can use many of the health system's services because the system allows them to collect all health information in one place. With the system, doctors are supported in making therapeutic decisions, while patients can manage their health records. The advantage of the IKP system is that patients can enter their medical data or receive notifications about medical appointments or the need to take medication. Patients have also the option to receive medical services remotely. IKP does not need to be set up, as IKP is available to any citizen with a PESEL (PESEL i.e., Polish Personal Identification Number, is an 11-digit number assigned to every person with registered residence in Poland containing information on gender, date of birth, place of birth, and document issue series number) number, but to make full use of this system, the account must be authorized. The problem arises here because the authorization must be done by a bank using iPKO or Inteligo online accounts, ePUAP, with Trusted Profile (Profil Zaufany, PZ), or an electronic identification card. The account can be accessed using the website and cell phone apps (Internet Patient Account, 2023). Unfortunately, the first authorization to the system is quite a challenge for older adults.

Therefore, in the context of previous considerations, one may wonder whether IKP leads to secondary digital exclusion of adults over 65 years of age with limited digital competencies. And could the digital divide exacerbate disparities in access to medical care, especially as patients' demand for medical care increases with age?

## **3. Methodology**

The findings presented in the paper are part of a quantitative survey conducted among older adults in 2022/2023. The study was conducted using quantitative research methods and survey questionnaire technique due to direct contact with respondents. The survey covered adults aged 65 and over living in Poland. The study used a diagnostic survey method based on a questionnaire technique that was addressed to older adults living in Poland. Purposive random sampling was used, taking into account gender, age, education, and place of residence. The survey included 570 older adults. It was conducted over a four-month period (October to January) 2022/2023.

The main research tool used was a standardized survey questionnaire consisting of 28 closed questions and statements. A Likert scale was used to rate the responses, which made it possible to evaluate the relative intensity of different responses (Babbie 2004, p. 192). The research tool (questionnaire) was designed by the author and created by the author of the paper. STATISTICA software was used in the process of compiling the findings.

For the purposes of the study, the focus was on the problem of accessibility of services provided by the IKP and the needs of older adults in this regard. The article attempts to answer the question of whether the introduction of the possibility of using the IKP service offers an opportunity for older adults to overcome barriers related to access to medical care or a tool that causes their digital exclusion from the healthcare system. To this end, an attempt was made to answer the following questions:

- Are older adults open to new technologies?
- Do they think new technology will have a direct impact on their health?
- Do older adults use the IKP app?
- Are they willing to use e-prescriptions?
- Do they make an appointment for a test or with a specialist using e-referrals?
- Do they use information about scheduled appointments with doctors and specialists?
- Do they check the information about the drugs prescribed to them through IKP?
- Do older adults use the option of lab result preview in IKP?
- Did they use the access to information during the COVID-19 pandemic sent by IKP?
- For the purposes of this study, the following hypothesis was adopted:
- Online Patient Account is a barrier for older adults to access medical care.
- Online Patient Account leads to digital exclusion of older adults.

#### 4. Results

The survey included 570 people, with 518 correctly filled questionnaires at a 91% return rate. The responses of 518 people who reported being older than 65 and using the Internet were analyzed. Respondents were men and women (with a preponderance of the former) in the age groups of 65 to 69 years (53%), 70 to 79 years (42%), and 80 years and over (5%). The survey was conducted among older adults living throughout the country taking into account demographic, social, and economic characteristics. In the study group, the most frequent characteristics were secondary and higher education, medium and large towns as the place of residence, married people, the income oscillating from PLN 2,000 to 4,999, and ended or current professional careers. Based on the survey, it can be concluded that there is a significant percentage of older adults in Poland who are characterized by openness to new technologies. Of older adults studied, 74% believe that new technologies are needed not only in the medical field but throughout the economy. They see them as an opportunity to grow the economy. This attitude is strongly related to age, place of residence, education, and material status. Analysis of the data shows that the respondents can be divided into two groups: those who are enthusiastic about new technologies (they account for 46% of the respondents) and those who have skeptical attitudes to these technologies, accounting for 54% of the respondents. The biggest supporters of new technologies are older people up to 75 years of age who are residents of large cities with higher education and satisfactory material status. In contrast, those with skeptical attitudes to new technologies are most often over 75 years old, have a high school education and lower income. This may be due to the fact that 76% of those aged 75+ have trouble using new technologies. In this case, the research shows, neither education nor place of residence plays a significant role, as the problem affects the entire population aged over 75 years.

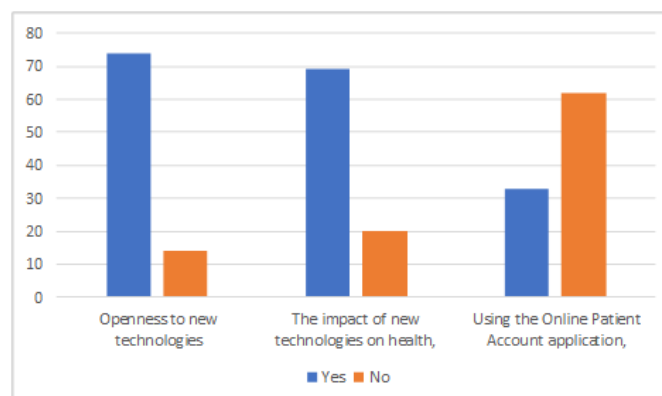
**Table 1: Older Adults' Attitudes to new Technologies**

| Criteria                                 | Definitely yes | Rather yes | Neither yes nor no | Rather not | Definitely not |
|------------------------------------------|----------------|------------|--------------------|------------|----------------|
| Openness to new technologies?            | 38             | 36         | 12                 | 8          | 6              |
| The impact of new technologies on health | 23             | 46         | 11                 | 12         | 8              |
| Using the IKP app                        | 12             | 21         | 5                  | 23         | 39             |

Source: Own elaboration

The survey also found that 69% of older adults agreed with the statement that new technologies will have a direct impact on their health and 20% hold the opposite view. The answer "Definitely not" or "Rather not" was marked by 20%. The statement about the impact of new technologies on health is met with the most opposition among men aged over 75 years with secondary vocational education and average incomes. According to the survey, the place of residence does not matter in this regard.

Of older adults surveyed, 86% had heard of the Online Patient Account, the most popular online medical service, but only 33% said they had used the IKP app.

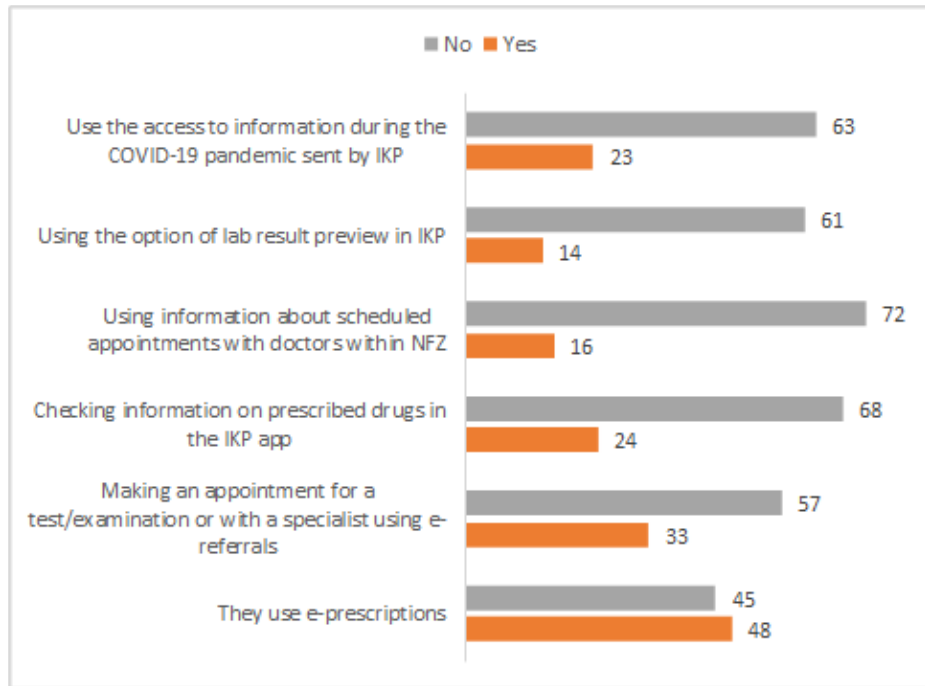


Source: Own elaboration.

**Figure 1: Seniors Towards new Technologies**

For most of them, the main reason for actively using the app on a daily basis is to use e-prescriptions (48%) and to make appointments for a test or see a specialist (33%). Almost all older adults surveyed (91%) had heard of e-prescription but almost half (45%) said they did not use it. Only 24% of respondents used the IKP app to get information about appointments and only 14% of them checked lab results through the app and 16% sought information about their prescribed medications. This is most likely due to their difficulties in accessing and navigating the Internet and lack of skills in using new technologies. Only 23% of the older adults surveyed had used information on disease incidence during the COVID-19 pandemic.

Interestingly, almost half of the respondents (44%) justified their decision not to use the IKP app by a lack of trust in the government app, 26% of respondents did not believe the government in the information provided about the pandemic and 8% of respondents did not believe the pandemic actually existed.



Source: Own elaboration

**Figure 2: IKO Services Used by Older Adults**

Taking into account the IKP app and the demographic and social characteristics of the respondents, their profile was created (Tab. 2). The results were processed using two-tailed tests, with a significance level set at 0.053. The tests are adjusted for all pairwise comparisons within each internal subtable using the Bonferroni correction (Krzysz, 2007).

**Table 2: Profile of Respondents by Demographic and Social Characteristics Using the IKP App; Percentage Of Highest Responses**

| Criteria   | Use of e-prescriptions | Making an appointment for a test/examination or with a specialist using e-referrals | Using information about scheduled appointments with doctors | Checking drug information | Checking the results of laboratory tests | Access to information during the COVID-19 pandemic |
|------------|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------|------------------------------------------|----------------------------------------------------|
| <b>Sex</b> | Women<br>78%           | Women<br>67%                                                                        | Men<br>56%                                                  | Women<br>58%              | Women<br>25%                             | Men<br>19%                                         |
| <b>Age</b> | 65-69 years,<br>55%    | 65-69 years, 81%                                                                    | 65-69 years,<br>29%                                         | 65-69 years<br>57%        | 70 years and more,<br>71%                | 70 years and more                                  |

|                                           |                                    |                                                         |                                 |                                                         |                                 |                                 |
|-------------------------------------------|------------------------------------|---------------------------------------------------------|---------------------------------|---------------------------------------------------------|---------------------------------|---------------------------------|
| <b>Education</b>                          | higher education,<br>78%           | vocational education,<br>71%                            | secondary education,<br>57%     | secondary education<br>68 %                             | higher education,<br>59%        | secondary education,<br>66%     |
| <b>Place of residence (size)</b>          | 501,000 residents and more, 43%    | 10,000-100,000 and 501,000 residents and more, 78% each | 501,000 residents and more, 76% | 10,000-100,000 and 501,000 residents and more, 77% each | 501,000 residents and more, 39% | 501,000 residents and more, 41% |
| <b>Financial status</b>                   | average and good, 15% each         | average 38%                                             | modest 68%                      | average and good, 15% each                              | good 36%                        | average and good, 15% each      |
| <b>Attitude towards chronological age</b> | younger/ according to age 15% each | younger 54%                                             | younger 61%                     | older 41%                                               | younger 48%                     | younger 65%                     |

Source: Own elaboration

It should be emphasized that high activity in terms of the use of e-prescriptions was found for women and those aged 65-69 years with higher education in the vast majority. Older adults who used e-prescriptions were those who had a good to moderate opinion of their financial status and felt younger or according to their age. Respondents from cities with more than 500,000 residents were statistically more likely to purchase prescription drugs than those from 100,001 to 500,000 residents.

Women were also more active in making appointments and examinations with specialists, checking information about drugs prescribed to them, and checking lab results. They most often represented an age group of 65 to 69 years, had secondary or higher education, and felt younger than they actually were. They rated their financial status as good or average. In contrast, men in the 65-69 age group were more active in checking information about scheduled appointments. Most had secondary education and lived in cities with over 500,000 residents. They described their financial status as modest but felt statistically younger than their chronological age. Men were also more active when seeking information on the COVID-19 pandemic. This group was characterized by age over 70, and like the above group, was distinguished by having secondary education and living in cities with over 500,000 residents. Information was sought by a higher percentage of those who felt younger than their chronological age than those who felt according to their age. Older adults used IKP services with varying frequency. The highest percentages were found in groups that used such services at least once a month (34%) and once every two/three months (27% each). The remaining 39% used them once every six months (23%) or less often (16%). These services were more often used at least once a month by women (47%), respondents aged 65 to 69 years (38%), and those assessing their household situation as modest (41%) and good (23%). People who felt younger, appropriate to age, and older than those who felt according to calendar age did so statistically more often (at least once a month). Women (39%) were more likely to use the IKP at least once a month than men (32%), those with secondary education (36%), those from cities with more than 500,001 residents (42%), those with modest (32%) and average financial status, and respondents who felt according to their calendar age (41%). Respondents who were very satisfied with the use of IKP were women (statistically significantly more often very satisfied than men), those aged 65 to 74 years (27%), respondents with secondary education (32%), those rating their financial status as modest (31%), those feeling younger than their calendar age (29%), statistically significantly more often than those feeling according to age.

## 5. Discussion

The results of the study supported the research hypotheses. Firstly, IKP is a barrier for older adults to access medical care. Secondly, IKP leads to digital exclusion of older adults. This is evidenced by the fact that only 33% of the older adults surveyed reported using IKP. Therefore, the results suggest a problem of digital exclusion of older adults, which may consequently exacerbate disparities in access to medical care. This is confirmed by research conducted by Statistics Poland (GUS), according to which, in Poland in 2020, only 11.8% of people aged from 65 to 74 years used the IKP service, while in the group of people over 75 years, the percentage was only 2.7%. Undoubtedly, the COVID-19 pandemic (Mirczak, 2020) contributed to the slight increase in the use of e-health services, including the IKP service. Among the data officially released by the National Health Fund (NFZ) and the Ministry of Health in Poland, there is no aggregate and comprehensive information to identify users of

the IKP service in terms of age. According to a website of the Ministry of Health and the National Health Fund, the smallest group using IKP is people aged over 75 years, who have activated more than 108,000 accounts. Despite the relatively low percentage of people 75+ (according to the website), it is in this group that the highest relative growth of activated accounts can be observed (during the first half of 2021, the number of activated accounts of people aged over 75 years was already twice as high as in the entire 2020). This does not change the fact that people of this age still have the lowest percentage of all users ( <https://www.cez.gov.pl/pl/page/onas/aktualnosci/juz-10-milionow-polakow-korzysta-z-internetowego-konta-pacjenta-w-serwisie> ).

The results of the survey also helped illustrate the specific situation of older adults and formulate important recommendations for their inclusion in the health care market. The use of IKP services by older adults can additionally be inferred from the results of a survey on Internet use in Poland: in 2021, the total number of Internet users was 28.2 million, of which 4.4 million were over the age of 55 years. The largest number of its users was found in the 16-24 age group (97%), followed by the 55-64 age group (76%), and the 65+ group (54%) (Statistics Poland, 2021). Furthermore, according to a 2020 study by the Centre for Public Opinion Research (Centrum Badiania Opinii Społecznej, CBOS), in Poland, 22% of people over the age of 60 years did not use the Internet at all, and in the 70-79 age group, the percentage of non-users was as high as 49% ( CBOS, 2020).

Older adults usually use the Internet for communication, browsing, reading news, and watching videos. Younger people, on the other hand, are more likely to use the Internet for entertainment, games, online shopping, and remote work and learning.

Older adults are much less likely to use e-health services such as mobile apps, telemedicine platforms, or electronic medical records. According to a 2020 CBOS survey, health-related mobile apps were used by only 12% in the 60-69 age group, whereas in the 70-79 age group, the percentage was only 2% (CBOS, 2020). In the case of e-health services, the most common motivation for using them is to obtain health information, check medical recommendations, lab results, and general recommendations to improve health-related quality of life (Martin-Hammond et al., 2019, 1983-1993; Bolle et al., 2016, 710-720 ). Older adults use these services to check their health, prevent chronic diseases, better understand test results, and get information on how to take care of their health. For younger people, mobile apps and platforms that allow them to contact a doctor online are also popular, especially in cases of unusual symptoms or situations where it is impossible to see a specialist (Kim et al., 2017, 159-166).

Furthermore, a study by Dudkowski-Sadowska demonstrated that the survey of attitudes toward the introduction of electronic health records (EHR) outlined a profile of a potential e-health user alongside a profile of a person who has no knowledge of such services. This group included mainly older adults, retired persons, those who did not use the Internet for health purposes, those who did not have a cell phone and those who poorly evaluated their health, being a significant part of Poland's population of older adults ( Dudkowski-Sadowska, 2022).

However, it should be noted that the above comparisons are general trends rather than a general rule. Use of the Internet and health e-services can vary depending on many factors, such as education, region of residence and severity of chronic diseases.

Therefore, digital exclusion of older adults leads to an increase in social inequality, reduced access to information, and online services, making it difficult for them to take full advantage of social, health, and educational resources, and negatively affecting the health and independence of this population. Therefore, it is important to take steps to close the digital divide and enable all social groups to use digital technologies.

Several measures should be taken to counter digital exclusion of older adults, such as:

- Training programs - organization of courses or workshops to help older adults learn how to use computers, Internet, and mobile applications.
- Interface customization: creating interfaces that are more intuitive and understandable to older adults and provide higher contrast, larger fonts, and other features to help them better perceive information.
- Popularizing e-services: educating older adults about the benefits of using e-services, such as e-prescriptions, e-visits, e-rehabilitation, e-referrals, etc.
- Technical support: organizing help desks for older adults to help solve problems related to the operation of digital devices.

- Involving older adults in digital transformation processes, enabling them to participate in IT and research projects that will help them engage and understand the benefits of digitization.
- Availability of equipment: providing access to computer and Internet equipment to older adults who do not have it at home, e.g. by organizing access in public places such as libraries, community centers, etc.
- Collaboration between the public and private sectors: implementation of programs that bring together the public and private sectors, and NGOs, to effectively combat the digital exclusion of older adults (World Health Organization, 2019; Kuerbis & Mulligan, 2018, ). .

These measures are aimed at increasing access to technology and knowledge, which in turn will help increase digital activity among older adults and reduce digital exclusion.

In conclusion, based on the research results of this study, the IKP service can be an effective tool for engaging older adults in caring for their health, but IKP providers need to be aware of the potential barriers causing digital exclusion of people in this age group to take steps to counteract them. Since the population of people aged 65 years and over is steadily growing, more attention should be paid to it in terms of access to modern technologies. However, it is important not to stigmatize older adults. Initiatives aimed at improving digital competencies should be tailored to the changing needs of older adults so as to improve their quality of life and ensure better functioning in their environment. The study found that the IKP service, despite its potential to redress inequalities in health care for older adults, is still in the development stage.

## **6. Conclusion**

Since the problem of e-health and IKP is a relatively new phenomenon, the results of the study focused on one country. Another research topic could be a broader analysis in an international collaboration, aiming to learn more about the specifics of older adults' use of digital health services in the context of the specific socioeconomic conditions of the region.

The research conducted shows that the IKP service, despite its potential to address inequalities in healthcare for older adults, is still in the development stage. Compared to younger groups, access to new technologies and digital competencies are still limited for Polish older adults and are a barrier for them to use digital health services. The study demonstrated the need for corrective measures in terms of knowledge sharing to maintain the independence of older adults and counter digital exclusion.

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