Do older adults need technological innovation? Analysis of the needs and opportunities with regard to new technologies on the example of Poland

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Abstract

Aim. The aim of the study was to discuss the question of whether seniors are interested in technological innovations and whether technological innovations appearing on the market are attractive to seniors.

Concept. New technologies appearing on the market are aimed at a wide audience. Their purpose is to improve daily life, quality of life, safety and assistance. Seniors are a specific target group, varying in age, functional and cognitive ability and economic capacity. The problems of senior citizens are a challenge to create technological innovations to improve their quality of life with examples from Poland.

Results. In the daily life of older people, it is difficult not to notice various forms of support. These include health and safety, independence, communication, but also education and development. Not all older people will use new technologies, due to various reasons and barriers. Developers and innovators should consider the needs of seniors and meet the requirements of tools for this age group. However, in this age of rapidly advancing technology, it is important to remember that the current generation of young and working-age people will learn to use innovations and, as elderly, will already be using technology on a daily basis.

Keywords: older adults, Technological Innovation, ICT

Introduction

The society of the elderly presents increasing needs and problems with their satisfaction. Not all needs can be met by seniors themselves, e.g. financial or care needs, which is why there is a need for systemic support and appropriate social policies. The catalogue of services and products in which older adults will be interested may differ significantly from what the market offers (Bakalarczyk & Potocki, 2022). The search for an answer to the question of whether older adults need technological innovations is extremely difficult, mainly because of the heterogeneous audience. Answers will differ just as older adults themselves differ. For some it will be too difficult, expensive, unnecessary, while for others it creates new opportunities and a chance to function more efficiently and interestingly. Not all older adults are able to keep up with technology, the presence of social media and digitisation. At the same time, many older adults realise that the media provide an opportunity to learn about the world, to keep in touch, but in order to take advantage of this, it is necessary to learn it, to acquire the right competencies (Wrońska, 2019).

The World Health Organization promotes an active model of aging (Rowe & Kahn, 1997), where great emphasis is placed on the earlier stages of life in order to stay healthy for as long as possible (Bakalarczyk & Potocki, 2022). Successful aging involves more than just physical health; it also encompasses maintaining mental sharpness, staying active in the community, and pursuing meaningful activities (Rowe & Kahn, 1997). Technology is part of keeping seniors active and healthy. As a result, older adults maintaining health and fitness will require less health care and will be more independent and self-reliant which will allow them

to be active and grow. The proposed new technologies appearing on the market are aimed at a wide audience. Their development in the field of health can be seen significantly after the pandemic period, where the situation in the country forced patients to participate in teleconsultation or videovisits. The development of the digital economy is very fast, and even now the digital exclusion of older adults is noticeable. According to the Central Statistical Office, in 2020 only 48.3% of older adults aged 60-74 used the Internet at least once a week, which means that more than half were unable or did not have the ability to use the technology, which excluded or limited them from social, cultural and informational life. The year 2022, according to the Central Statistical Office, indicated an increase in people's use of the Internet to 58.8% among older adults, but this remains a much lower rate than among young people (Kamińska- Gawryluk, 2023; Kamińska-Gawryluk et al., 2020). It is difficult to expect that all older adults will keep up with technological innovations and be able to use them, however, the task of innovation is to improve daily functioning, improve quality of life, as well as improve safety and assistance in a broad sense. Older adults are a specific group of recipients differing in age, functional and cognitive abilities, and economic capabilities or needs. Extended survival, longevity, double aging is the picture of an aging society in many countries of the world, which does not always go hand in hand with a good quality of life for older adults. Keeping the elderly fit, providing care and safety are challenges for older adults that are becoming a challenge to create technological innovations to improve their quality of life and health. It can be difficult for older adults to keep up with changes and innovations, which is why some of them are excluded from using technological novelties. People are also often reluctant to learn new things because it comes more difficult as they get older, and just as often they don't want to change their habits and thus prefer to function according to proven patterns (Gopnik, Griffiths, & Lucas, 2015). Many factors will speak for the use or not of technological innovations. For example, age and education, according to the Central Statistical Office, are factors that determine computer use (Kamińska- Gawryluk, 2023). Undoubtedly, the economic factor and the presence of a person who will teach the use of technology becomes an important element in introducing technological innovations into the lives of older adults. Exclusion of older adults from the use of technology can lead to marginalisation in access to goods and services which are provided only through the Internet. When asked why they do not use technology, older adults answer that they do not have such a need or that they cannot (Bakalarczyk & Kotecki, 2023).

The COVID-19 pandemic has significantly altered technology use, highlighting digital exclusion, especially among older adults. Older adults may be the most affected group, becoming "invisible" due to a lack of digital skills needed for essential activities like sending emails, paying bills, or attending online meetings (Czopek, 2022). Despite increased family support and some older adults adopting digital tools, many struggle with virtual engagement, particularly in online activities offered by senior centres. Although the pandemic spurred a shift towards digital payments and communication, it also underscored the persistent digital divide and its impact on older adults.

Batorski and colleagues (2010) identified five attitudes of older people towards digital technologies:

− Active internet users who are open to new solutions and expanding their skills (Polish older adults fall into the first category the most often).
− Internet users who meet specific needs online/ navigate the web independently (a dozen percent of elderly).
− Non-users who had the chance to start using the internet but did not (second biggest group in Poland, for whom telemedicine was a first contact with modern Information and Communications Technology (ITC)).
− Individuals without access to new technologies (small – just a few percent – and also difficult to meet i.e. living in remote areas of Poland).

Thus, the subject of the article are mainly Poles from the first category. Barriers they face include a lack of motivation and fear driven by harmful beliefs and prejudices about technology. These prejudices are often reinforced by other age groups, resulting in older adults lacking encouragement and support to use technology.

This raises the need to promote and educate about new technologies with a twofold aim: to care for older adults and also provide them with greater independence and a better quality of life. Many apps are being developed just for older adults. They remind of medications, the need to move, take a meal, locate the senior or allow you to quickly call for help, but for this you need to purchase the right device, phone and, above all, teach older adults to use the goods of technology. Certainly, the younger the person, the easier it is both physically and cognitively to accept, learn, know and use the novelty. There is also a large group of older adults who are interested in novelties and are eager to use them. Participation in Senior Citizen Clubs, University of the Third Age, groups at parishes, organisations and other forms of formal or informal gatherings allows, above all, to maintain social contacts, flow of communication information, exchange of experiences and learning about various technological innovations.

The ubiquity of new technologies makes it impossible for older adults to avoid them, and many choose ICT to contact their family (video calls, online meetings) , learn, fight loneliness, gain medical advice, or do shopping. The media space also allows older adults to be active by creating their own blogs, film reports or music (Wrońska, 2019). The population aging is a fact however, the development of technology is also happening. This means that the elderly will be a significant part of the recipients of technological innovations, and education and promotion of technology should be aimed at them. The ability to function in everyday life with the use of technology is becoming a prerequisite for holistic participation in life in all its aspects (Mękarski, 2015; Toczyski, et al., 2009). It should be borne in mind that older adults, like the next generation of young people, will change and their needs will also differ, so the gradual introduction of technological innovations is becoming a reality and is undoubtedly necessary in the care of elderly people. According to Wrońska (2019), there is no age limit that prevents the use of technological innovations. This shows the importance of the need, desire and means of reaching older adults.

Aging is an inevitable process that affects all of us, but in order to avoid isolation, marginalisation and social exclusion of older adults, one of the objectives is to activate and learn new competencies, including those related to new technologies.

Objective

The aim of the study was to try to answer the question of whether older adults are interested in technological innovations and whether emerging technological innovations on the market are attractive to older adults' based on reflective review on the current situation in Poland. Here we will mainly discuss lessons learnt from implementation and pilot testing of telemedicine solutions for the Chronic Diseases model in years 2023/2024 in Poland.

Results and discussion

In the daily functioning of the elderly, it is difficult not to notice various forms of support. These relate to the areas of health and safety, independence, communication, but also education and development, among others. Not all older adults will use new technologies due to all sorts of reasons and obstacles. However, in an era of rapidly developing technology, it is important to remember that the current generation of young and productive-age people will learn to use innovations and already for them as older adults the use of technology will be an everyday occurrence. Increasing the activity of older adults in various aspects: health, social, professional, civic through technology and innovation should be part of education and care for older adults (Zapędowska-Kling, 2015).

Currently introduced technological innovations aimed at the elderly have no chance to reach all older adults. There is a lack of opportunities to reach every senior due to age, financial constraints or cognitive abilities of the client, or the lack of a permanent caregiver who could act as a liaison for the recipient of technology aimed at older adults. Data from the analysis of the Central Statistical Office shows that more than 40% of older adults aged 59-74 do not use the Internet. It is reasonable to assume that these people are also not inclined to use other technological innovations.

Telemedicine can be used to care for patients with geriatric issues such as frailty syndrome, sarcopenia, and malnutrition. These needs caused Wroclaw Technical University to propose a holistic model of home and outpatient care targeting these conditions (Tański et al., 2023). As a pilot, the project aimed to clinically verify the new method and its accompanying organisational and technological solutions. The analysis of different phases of other pilot projects Pulmorehab done by JPII hospital in Glucholazy highlights that the critical stages for the success of telerehabilitation of chronic patients (Bogacz et al., 2024) are the initial phase, when the patient is introduced to the programme, and the liminal phase, where the decision to stay in the programme is made, often despite

the initial lack of noticeable health benefits. Therefore, it is crucial to thoroughly introduce the patient to the process right from the qualification stage, dedicating more time to educational efforts by medical staff (physiotherapists) and support staff (training the patient on system use), especially for older adults and those with disabilities.

Despite various technical and adaptive challenges, particularly with older participants using modern technologies and individual programme adjustments, most participants found the programme intuitive and easy to use daily (thanks to engagement of the paramedical personnel).

It was proved in multiple projects done by Aidmed (Bogacz et al., 2024; Romaszko-Wojtowicz et al., 2022) that ~20% elderly patients needed retraining to use the system for telemonitoring, requiring continuous support from a technical consultant. Explaining technical issues to older adults with low e-literacy was time-consuming. To address this, the application was simplified based on patient feedback, featuring a single page with vital information, larger buttons, and fewer notifications to reduce confusion and fear. Automated pairing with devices further eased use. Distrust due to internet frauds and fear of financial responsibility led some elderly patients to refuse participation. Ensuring inclusivity in telemedicine services is crucial, although certain groups had to be excluded from the control arm of the trial due to severe disabilities or lack of a communicable guardian. Concluding, the Polish experience suggests (Maksymowicz et al., 2022; Siwak et al., 2021) some requirements of such systems from a supply perspective (platform and app/device).

Figure 1

Adopted from Popowski and Damps model of inclusive telemedicine in the population of older adults (Mirosławska et al., 2020) presented in the preliminary version at 38th Congress of the Polish Lung Association in May 2024

The results of the pilots show:

- The potential to reduce patient waiting times and better monitor disease progression, however a longer preparation period is required for stuff to learn.
- Communication of healthcare staff plays a key role (mainly nurses who spend the most time with patients on phone and video consultations), and patient recruitment must be individualised and coordinated over time (crucial role of medical coordinator who explains clearly everything to a patient).
- The severity of disease determines whether a patient should be included in the telemedicine programme in the "Chronic Diseases" model at all. Patients with moderate problems (such as moderative obstruction in COPD) will benefit most from monitoring via telemedicine in this model. Too severe patients (i.e. <30 points on Bethel scale) or physically active patients without any chronic disease were not benefiting so much from long term tele-monitoring programmes. Staggered recruitment (projects should be several years in duration) will work best.
- To train the patient in person before giving to the home sensors such as: smart band, pulse oximeter, spirometer, ecg recorder, for responding to specific disease symptoms by regularly posting information about them on a telemedicine platform, would allow the medical staff to properly assess their health status.
- Social determinants of health and telemedicine create more opportunities, but there are still multiple threats for more inclusive medical management.

JPII cohort of elderly COPD patients attending telerehabilitation proved
- statistically significant (t-test before/after p<0.05 Sczegielniak scale) somatic performance improvement;
- statistatistically significant (t-test before/after p<0.05 CAT scale) subjective health improvement
- high satisfaction with use system (SUS scale).

Telemedicine platform requirements include:
- Access to medical data and integration with an internet patient account and hospital information systems
- Teleconsultations (including video consultations) with simple one-button solutions
- Training the staff - engaging young healthcare workers as much as possible
- Telemonitoring - remote assessment of patient condition - integration of medical equipment and wearables

Mobile Apps/ wearables requirements are the following:
- Individual rehabilitation schedule
- Biofeedback
- Fall detection
- Support in following medical recommendations
- Education

Constantly motivating older adults to be active through using technological innovations, acting in the media space contributes to their successful aging. Universal Design (Petri et al., 2016) - this doctrine in the design of objects and services assumes that everyone using it will be able to use it freely and intuitively, regardless of health, age, education, etc. Definitely, age and the level of physical and mental fitness is a factor that differentiates the willingness and ability to use technological innovations. In times of the general cult of youth, the image of the senior citizen is also changing. The model of a senior full of interest, invention, ideas and realisation of one's own plans is conducive to the introduction and learning and use of technological innovations.

Conclusions

Technological innovations are a constant element in everyone's life, including older adults. Created with older adults in mind, they are designed to help improve the daily lives of older adults. It is also important that technology is designed with seniors in mind. Motivation and support are not enough if the product is not adapted to this group, e.g. has keys that are too small. Developers and innovators should give consideration to the needs of seniors and meet the requirements of tools for this age group. However, in order for this to happen they have to be delivered to the recipients, which requires motivating people to learn and use the innovations, as well as implementing systematic ongoing care for older adults so that they are not excluded from any aspect of life.

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