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SMART E-HEALTH: THE BENEFITS OF ENHANCING THE AWARENESS AND BEHAVIOR OF SOLUTIONIST TECHNOLOGY USE

Abstract: For the healthcare industry to undergo the necessary changes, new technology, creative solutions, and interactive platforms are now crucial. Solutionist technologies can have numerous benefits, if used knowledgeably and properly. However, despite the large body of work on innovations in smart health, especially in e-health, e-advice and m-health, there is lack of studies on patient awareness and behavior, which has negative consequences for their wellbeing. This study sets out to find out about the views/opinions of patients/consumers using innovative solutionist technologies for smart e-health. To achieve this aim, a survey method is adopted using questionnaire. The findings are illuminating, revealing widespread illiteracy, a lack of information, and a fear of taking drugs without contacting a doctor. Knowledge is a key factor for promoting trust in smart e-health, and its level and flow are directly tied to trust and the ability to employ a variety of technologies. The study confirms the idea that an increase in knowledge raises the amount of trust in alternative solutions. Consumers can gain knowledge and behavioural skills in a certain domain over time if they have trust. In addition, although there is a willingness to try new ways, the lack of understanding how to apply them leads to several challenges.

Keywords: e-health, Health Knowledge Management, Digital Technologies, Quality of Life

1. Introduction

The prevalence of social and health issues jeopardises our society's well-being and, in turn, the capacity of coming generations to achieve their requirements and goals. When we lack plans that are more effective and tactics for preparedness and responsiveness, these concerns are frequently expressed in the wake of significant global events, such as pandemics and economic crises. The Covid-19 epidemic period demonstrated how reliant on healthcare we are (Akrich and Méadel, 2009; Brown et al., 2014), how we waste resources buying "healthy" and "saving" products online, which are not drugs or even supplements (Bessant, 2019). Most consumers ignore the dangers of their deteriorating health situation and rarely visit doctors (Chretien et al., 2013, 2015). It is also very difficult for people, in particular Europeans, to admit the need for psychological or psychiatric treatment (El

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Morr and Eftychiou, 2017; Doxey, 2021). This was also greatly influenced by the covid-19 pandemic, home office and social isolation. Unfortunately, the diseases related to the human psyche and mental problems have caused the abandonment of treatment or looking for home remedies, advice from people with similar diseases on forums, chat rooms or often online advice from unverified "specialists" (Engel et al., 2020; Hays, 2021b).

Overexploitation of the body causes the problem of multiple diseases, increasing symptoms that hinder everyday functioning (Iakovleva, 2019). The consumer wants to receive help as soon as possible, learned in the era of consumerism that every product can be immediately available, and would like a medical advice to be held online (Menvielle et al., 2017b). The medical services market responded to this demand and innovative solutions appeared, such as m-health, e-prescription, online advice (Syed et al., 2013). However, the extensive practice of research within such solutions has also sparked criticism, and the assumptions justifying the related initiatives have also been challenged in recent research with regard to digital divide associated with the use of new technologies. This especially pertains m-health (e.g., Helsper et al. 2017; Haenssgen 2018), adding to people integrating mobile phones into their health behaviour without external interventions (Hampshire et al. 2015).

Furthermore, the terms "innovation" and "innovative" are often used in a range of areas, including healthcare (Bessant, 2019).However, as of yet, no comprehensive, generally accepted definition of innovation exists (Wald et al., 2007), and several sciences (Simon, 2016), including economics, public health, geography, and sociology, utilise slightly different conceptions (Thoër et al., 2017; van Leijen-Zeelenberg, 2015). Schumpeter, one of the first economists, recognised the need of innovation in all economic systems, from a single firm unit to entire countries and the

global economy (Żywiołek, 2018; Yülek & Santos, 2022). Innovation, according to him, is any alteration to a technique, procedure, good, service, or organisational design tant people accept. Additionally, he described it as the "creative destruction" that drives all technological improvements in a capitalist market economy. In certain ways, innovation is different from invention (Kodama, 2015). While an invention describes the first, innovation can be thought of as the first commercial application of a novel idea as well as the economic optimisation of knowledge utilisation (Laudal, 2019). Therefore, a successful market launch is referred to by the more specific term "innovation." In a market economy, the free market ensures that the invention has a chance to establish itself and the possibility to become a new standard, but it does not mean that it will ultimately prevail (Matsushita, 2021a; Garrot and Angelé-Halgand, 2017). The generation of ideas and the first technical implementation, such as a prototype, constitute an invention, while innovation is a more comprehensive process that begins with the generation of ideas and ends with positive acceptance by potential users (adoption), though both concepts are closely related to one another (Hwang and Christensen, 2008).

In the health sector, and others sectors, improvements in quality come from service and quality of life innovations (Żywiołek & Schiavone, 2021; van Leijen-Zeelenberg, 2015; Sá et al., 2019; Jimenez et al, 2019; Fonseca et al., 2022; Sá et al., 2023), but are also a constant challenge for existing healthcare providers and systems (Broom, 2005). Advances in medicine require new technologies (Slametiningsih et al., 2020) (e.g. drugs, implants and devices), procedures (e.g., new surgical techniques) or forms of organization (e.g., palliative medicine as an innovative form of care) (Simon, 2016; Aswathy et al., 2022; Giannoccaro et al., 2022). Among the most innovative technologies to consider in this regard are the Internet of Things (IoT), Big

Data, and Artificial Intelligence (AI), This includes their merger under what has come to be identified as AIoT (Adly et al. 2020).

This study sets out to find out about the views/opinions of patients/consumers using solutionist technologies for smart e-health. To achieve this aim, a survey method is adopted using questionnaire. Based on the specified aim together with the literature review and practical observations, two hypotheses are developed: (**H1)** the amount of understanding online treatments boosts trust in these treatments and therapies, and (**H2)** smart e-health technologies have increased the accessibility to online therapy and treatment.

The format of this essay is as follows: The review of the literature is found in Section 2. The research methodology used for this study is described and supported in Section 3. The outcomes are shown in Section 4. Discussions and conclusions round out this essay in Section 5.

2. Literature review

In order to illustrate model patient behaviours from the perspectives of various illnesses and Internet access, the literature review sought out scientific papers (Beck et al., 2014; Boer et al., 2007). The authors conducted extensive literary studies based, among others, on publications on innovation, digitization and digitization of healthcare, e-health development in a very careful way over the last 10 years. The literature review shows that the main focus of the management science issue is the characteristics and behavior of patients who are consumers at the same time (Chen et al., 2021). Doctors are experts in the field of health (Brown et al., 2014), while patients/consumers are responsible for managing their time (Archambault et al., 2013), health, access to health information and knowledge (Żywiołek, 2018). In the context of this paper, the solutions provided to patients and their typical consumer

behavior were of particular interest.

There are numerous articles on consumer characteristics and behavior in the scientific literature (Thompson, 2007). These publications are mostly about products, less often about services (Sillence et al., 2007). It is understood that a medical service is also a service, but it puts the recipient of this service in a completely different position (Rantala and Karjaluoto, 2017). Then, the consumer becomes the patient. This makes sense considering that these characteristics and behaviours determine the effectiveness of management and its results (Murray et al., 2003). To enhance the calibre of services provided and the wellbeing of the community, the most desirable qualities and behaviours are principally sought through the creation of the theory of traits (Li et al., 2022). However, the relationship between these features and the behavior of patients is unclear when the patient treats health as a consumption of a service or, moreover, tries to use the tools available to him on his own, as evidenced by the examples of publications presented and analyzed below (Isham et al., 2013; Kaba and Sooriakumaran, 2007; Kreps and Neuhauser, 2010). Therefore, the issue of developing a model patient profile with the perspective of access to tools and knowledge remains unresolved (Demiris, 2006; Dedding et al., 2011).

According to research, there will be nearly three times as many Europeans over the age of 80 in 50 years as there are now (Antheunis et al., 2013; Audrain-Pontevia et al., 2017). However, with the increase in life expectancy, the probability of limiting the availability of visits to the doctor increases for seemingly trivial reasons: limited mobility, multiple diseases of the elderly, forced isolation (Gopalakrishnan et al., 1991). Unfortunately, the state of health in society causes anxiety, 20% of people's lives are considered to be "unhealthy," so drastic changes are required to address this issue and encourage seniors living healthier and more active lives. (Johnston et al., 2013; Mishra et al., 2022). Targeted initiatives in

recent years, collaborations have been established across Europe to address the challenges facing the elderly and, in fact, to help improve the quality of the 'how' in Monsieur Renard's comments 'how old' (Mishra et al., 2022; Morgan and Hunt, 1994). The growing demand for healthcare services across Europe coincides with the need to support an ageing population. Moving care delivery from hospitals to the home and the community can help ease the pressures in healthcare (Eysenbach, 2008). Effective policies, technology, education and resources are needed to create optimal "at home" care systems. Widespread improvement in health awareness and self-medication will be key to the success of home care models (Mann et al., 2020; Pardhan et al., 2021).

The outbreak of the COVID-19 pandemic propelled digital health and related services around the world. Digital solutions quickly emerged as a market leader in providing care both locally and worldwide to support infection (Grigoletto et al., 2022). In response to the COVID-19 pandemic, there has been an increase in remote or virtual consultations in both primary and specialist healthcare worldwide (Barker and Barker, 2022). Assistive technologies have used compliance support applications (i.e., computer programs running on mobile devices), and SMS reminders have helped professionals with remote patient care.

Digital medical technologies are categorised by the National Institute of Health and Care Excellence in the United States and the United Kingdom. It is based on qualities such system services (e.g., electronic prescription systems) (Barker and Barker, 2022), active monitoring applications that connect to sensors (Haar and Ernst, 2016), and wearable devices that are designed to enable remote monitoring of patients by healthcare professionals, and advanced Artificial Intelligence (AI) programs that use data to guide diagnostic decisions (J. Zywiołek et al., 2021). Bibri (2021) distills, based on case study research in Europe, the benefits of the data-driven approach to healthcare in the context of smart cities.

There are so many options available today that healthcare organisations must be able to guarantee that the digital solutions they use are useful, secure, and efficient (Żywiołek et al., 2021a; Krishna and Thompson, 2021; Moore et al., 2021; Santos & Barbosa 2006; Zgodavova et al., 2020). With the overall objective of extending the healthy life expectancy of people of the European Union (EU) by two years by 2020, websites have been established up all around Europe to focus on a comprehensive, innovation-driven approach to this. Although it is currently unknown if this objective has been accomplished, work is still being done (Smit et al., 2021). Healthcare has undergone a digital shift that has permeated the whole sector. A few of the cutting-edge e-health innovations that are going to become standard practise include wearable technology, online health portals, telemedicine, electronic health records (EHR), and online appointment booking. Since they are at the forefront of cutting-edge digital technologies like AI and are exploiting the sheer size of their markets, the US and China are paving the road for this development to become widely accepted (Mehta, 2019; Matsushita, 2021b). Implementation of telehealth technology, such as remote medical evaluation and online access to medical treatment, has accelerated and gone global due to the current Covid-19 epidemic of physical separation and healthcare professional shortage. This healthcare revolution is projected to continue after the pandemic (Murphy et al., 2022). In fact, the covid-19 pandemic has sparked a sudden, widespread digital transformation of society. This digitization and digitalization process is opening the door for accelerating the datafication, algorithmization, and platformization of healthcare as well as socialising, working, learning, playing, travelling, and other activities, as well as the social organisation resulting from these

interactions and activities (Bibri and Allam, 2022; Bibri & Krogstie 2021; Bibri, Allam, and Krogstie, 2022; Taylor & Soneji, (2022).

Large improvements in medicine over the past few decades have led to a large rise in life expectancy. Globally, the life expectancy at birth grew from 66.5 to 72.0 years between 2000 and 2016. According to the Global Burden of Disease, our susceptibility to diseases increases with age. This illustrates the positive correlation between healthcare spending and population ageing.

The primary cause of older health care costs is dementia. Around 47 million people globally had dementia in 2015, and that number is projected to double every 20 years to reach 75 million by 2030, according to Alzheimer's Disease International. By 2030, dementia is projected to have cost the global economy $ 2 trillion, up from an estimated total of USD 818 billion in 2015. According to the 2018 Global Burden of Disease report (Ratheesh and Alvarez-Jimenez, 2022; Street et al., 2009; Żywiołek et al., 2021b), mental illness affected 32% of the world's population and ranked first in YLD. In addition, people with chronic conditions who have mental health difficulties consume health care resources and costs considerably more frequently.

Research on the characteristics and behavior of patients does not solve the problem of modeling the behavior profile and identifying the problem of traits. As emphasized in the introduction to the article, smart e-health is a combination of an expert in the field of new technologies and an expert in the field of knowledge management. Therefore, the model patient/consumer is not enough to have only model features resulting from the previous theories. Such people need to have certain attributes that will allow them to function effectively in the area of their health.

As the literature review shows, scientists pay a lot of attention to patients who are also consumers. The literature lacks publications presenting model behavior profiles,

illustrating access to knowledge, the level of social awareness, trust in doctors and new technologies. This perspective is of particular importance because only competent patients in these different areas will be able to take care of themselves. So, in science as well as in economic practice, there is a loophole that the authors attempt to fill in this article by creating a model patient profile from the perspective of a conscious consumer.

Although the literature abounds with publications on innovations in the health sector, especially on e-advice innovations, it lacks studies on patient awareness and behavior, which has several negative consequences. To begin with, the management of health is in the hands of the consumer who enters the symptoms on the Internet and derives information about their health from it. In addition, failure to create knowledge about the use of new technologies and access to smart e-health among an ageing population can have catastrophic consequences. Finally, without creating awareness in patients and trusting modern methods, it cannot be transformed into a healthy and conscious society in the future.

3. Materials and Methods

The authors of this study adopted the following research procedure: establishing a model customer/consumer profile; and defining its behaviors and characteristics, with an indication of those related to smart e-health. The patient/consumer profile is presented in the second part of the article. It is the authors' original idea because it was created by them. Empirical study was necessary for the second step of the research process. The aim of this study was to find out about the views/opinions of patients/consumers using solutionist technologies for smart e-health. To achieve this aim, a survey method was adopted using questionnaire. The study was conducted in the second half of 2021. It included patients

declaring the use of advanced technologies in the field of medicine and treatment. These patients were aged between 18 to 70 and came from Poland, Norway and Estonia. Due to the covid-19 pandemic, we gave up direct contact with managers. To discover patient feedback, we used an online survey and tested 11,682 residents of these countries. The authors of the article concluded that the selection of the research method and a research tool based on a 5-point scale would allow us to obtain reliable research results. Most of the respondents were aged between40 to 49 and of as much as 38%.

In order to address the research topic, the research questionnaire asked patients 23 questions. The responses were indicated on a point scale that was included with each question. Utilising the representative method, the study concentrated on preferences and potential behaviour, knowledge collection, and trust-building. The sample satisfies the need for representativeness, and the lack of country-specific outcomes was caused by similar geographic conditions and a high level of societal awareness of smart e-health (31% of the population across all nations). These have the same objectives, strategies, and presumptions. Positive social reactions are generated through encouraging proper conduct and educating citizens.

The possibility of free travel between nations that are members of the European Union or the Schengen zone provides the chance to exchange knowledge, ideas, and insights on solutionist technologies. European populations have a similar level of economic development and cultural profile. Nine specific questions for the Servqual approach made up the second section of the study, which assumes that the provision of the right quality of service is correlated with the response to the expectations of the consumer. It is based on measuring the difference between the quality perceived by the consumer and the quality that this consumer expects from a given service.

In order to show the similarities between countries as to the behavior and preparation of the national health system, the authors prepared a summary. Despite the differences in the size of countries, a noticeable common feature is the level of awareness, forces and resources committed by individual countries. Table 1 shows the factors assessed as similarities in prevalence and the percentage of country involvement and use of society.

Table 1. The similarities in the use of smart e-health methods and the percentage of use by society. (data from 2021)

Health factors	Poland		Norway		Estonia	
	Average Value					
Source of smart e-health financing - public funds	77%		77%		77%	
eHealth capacity building: Health sciences students	50-75%		<25%		25-50%	
Health professionals	25-50%		25-50%		<25%	
	know	use	know	use	know	use
Applications, national programs	84%	79%	86%	82%	93%	84%
Social media and health	86%	83%	88%	85%	91%	88%
Big data and health	78%	63%	79%	72%	82%	73%
Electronic Health Records (EHRs) (year of creation)	2009		1981		2007	

Source: Previous study based on WHO data from 2021

Table 1 shows the structure of the countrys's involvement in smart e-health activities. Knowledge and use of these new forms of access to "health" is a manifestation of service consumerism and public awareness. The huge interest in access to health services and advice also raises problems, as shown in Figure 1.
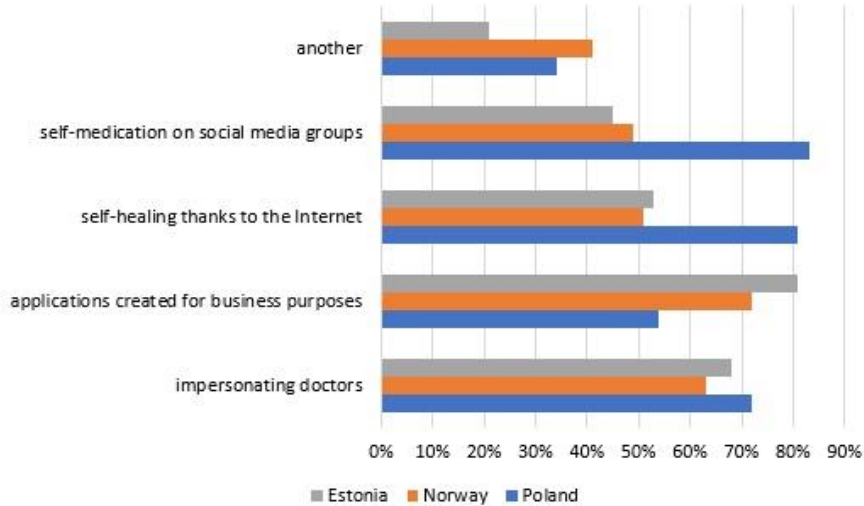
Figure 1. Smart e-health problems in selected countries
Source: WHO data from 2020 (Hays, 2021a)

4. Results

The identification of barriers and problems made it possible to define the suitable method of proceeding to solve the problem. The scope of self-treatment with the use of the Internet, online treatment, support methods and applications are presented in Table 1, descriptive statistics for all analyzed constructs, which are related to each other in terms of the effectiveness of the activities carried out on the management of remote treatment methods. Based on the results in Table 2, we can see the moderate mean value for the construction of knowledge and information in the field of treatment (3.51). The mean values for the remaining four constructs that measure the range of remote treatment management methods are low to moderate at best. The average values are: responsibility for treatment (2.77), implementation of solutions (2.81), availability of information and creation of knowledge (2.87), and treatment support modern methods (2.94).

Table 2. Mean values and Cronbach's α coefficient

Variable	Average value	Cronbach's α
Online treatment knowledge	3,51	0,84
Responsibility for management	2,77	0,87
Implementation of solutions	2,81	0,79
Availability of information creating knowledge	2,87	0,91
Treatment support modern methods	2,94	0,88
Improved communication	4,43	0,76
High awareness among patients	5,50	0,93
Strengthened cooperation in the field of applied treatments	3,60	0,82

Our part of the research focused on taking actions for smart e-health. By proving the presence and strength of reliance, the first section of the investigation was finished. In the first step of the Servqual study, it was determined the discrepancies between the levels of consumer awareness and perception of energy management and the levels anticipated for the five dimensions. The results are shown in Table 3.

**Table 3.** Differences in perceptual levels were studied using Servqual

	Features	P	E	Servqual Results "SS" Is the Level of Satisfaction SS = E − P
Online treatment knowledge				
Average Servqual: 0,87				
1	Patient involvement in treatment	9	9,34	0,34
2	Constant monitoring of the health level and disease progression	8	8,18	0,18
3	Knowledge of online treatment options	9	8,76	-0,24
4	Patient involvement in changing attitudes	9	9,59	0,59
Responsibility for e-healt management				
Average Servqual: 2,95				
5	Access to information and knowledge	7	6,82	-0,18
6	Usefulness and ease of interpretation of information and knowledge	9	9,43	0,43
7	Patient's level of knowledge	7	8,21	1,21
8	Possibility of combining different treatments	7	8,49	1,49
Availability of information creating knowledge, improved communication				
Average Servqual: 0,06				
9	Alternative ways of communication	8	7,66	-0,33
10	Information systems enabling the search for help	7	6,51	-0,49
11	Organizational activities to disseminate information and knowledge	6	5,28	-0,72
12	Online treatment culture	9	9,68	0,68
13	Managing medications and supplements	7	7,92	0,92

High awareness among patients				
Average Servqual: 0,34				
14	A high level of self-healing confidence	7	7,64	0,64
15	Trust in online therapy / treatment	9	9,71	0,71
16	Patient information campaigns	8	7,47	-0,53
17	Monitoring applications	6	5,12	-0,48
Strengthened cooperation in the field of applied treatments				
Average Servqual: -0,48				
18	Errors in reasoning and application of solutions	6	6,24	0,24
19	Lack of trust	8	6,28	-1,72
20	Use of medications and therapy based on similar symptoms of friends / family	8	8,69	0,69
21	Ignorance / fear of alternative treatments	6	6,49	0,49
22	Online search for symptoms and self-treatment	6	6,23	0,23
23	Fear of a serious disease	7	6,48	-0,52
24	No treatment	7	7,11	0,11

A graph was produced based on the data in Table 3, which included the results of the Servqual method of perception and expectancies analysis. Figure 2 depicts the graphical representation of the Servqual method's outcomes.
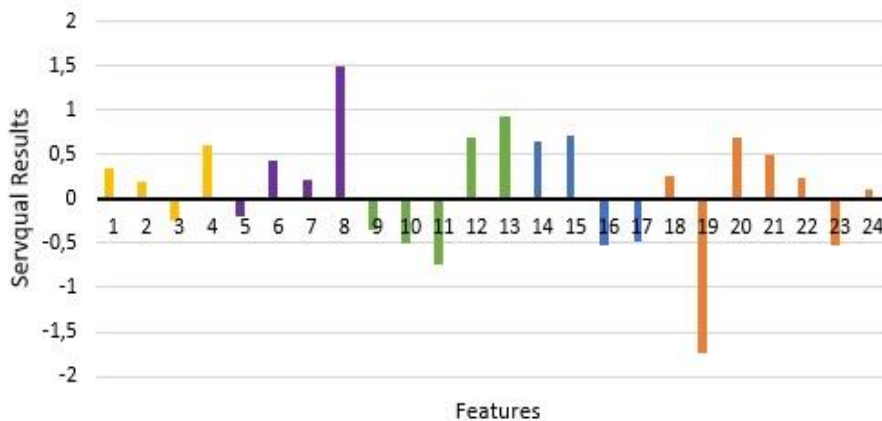

Figure 2. Results of the Servqual analysis

The results demonstrate that satisfaction was attained in 15 of the 24 feasible situations, while there was no level of satisfaction with the actions linked to information systems targeted at assisting patients in the other cases. For knowledge dissemination organizations, health monitoring applications, loss of trust in treatments and doctors, and fear of disease, dissatisfaction is critical. However, the sources of discontent were lack of understanding, anxiety, and maybe a terrible treatment experience. As a result, it is safe to infer that they are considered as a good area to run social marketing and gain patients' confidence and knowledge. Taking action on one own, such

as taking drugs or supplements in the case of having similar symptoms, is a very risky phenomenon. It is just as risky to try to heal yourself by typing your symptoms into a search engine. The findings of the study allowed for the identification of the factors that influence the determination of what constitutes online treatment.

The opportunity to blend ancient and modern therapeutic approaches, as well as the safety culture, were the most satisfying features. Figure 3 illustrates the results of applying the Servqual method to calculate the arithmetic mean for each of the investigated areas.
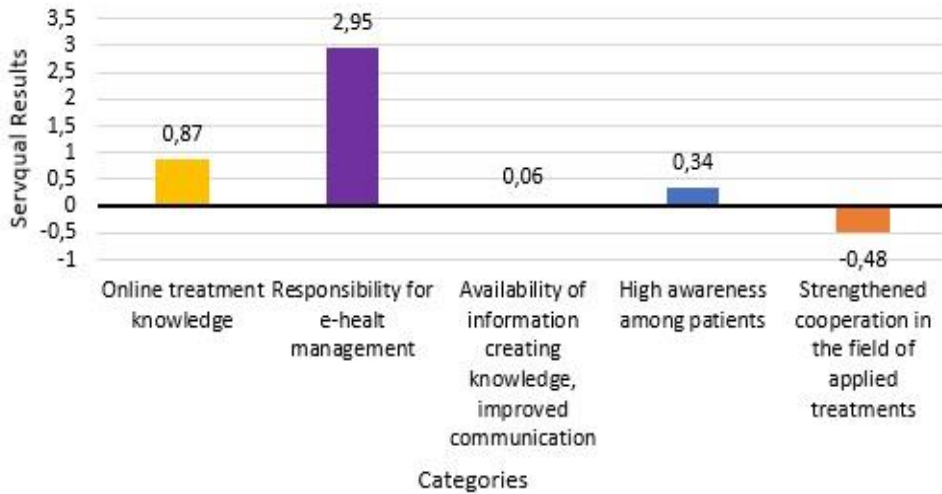
Figure 3. The arithmetic scores for the Servqual analysis

For three aspects, positive arithmetic means were achieved; only the cooperation in the patient-doctor interaction in traditional treatment and online treatment yielded a negative outcome. This phenomenon appears to be extremely concerning and will be the topic of a separate investigation. The arithmetic total measure of satisfaction was the next stage in the Servqual technique. The fifth and final phase was to assess the significance of the five dimensions. The

interviewees gave each of the above-mentioned satisfaction and quality criteria 100 points. Table 4 illustrates how respondents rated the importance of the five dimensions.

The weighted means of the different dimensions, as well as the total weighted mean of the Servqual technique, were calculated using the mean values, and the results are provided in Table 5.

**Table 4.** Validation assessment of five dimensions for the Servqual analysis.

Feature Category	Evaluation	
	Value	
Online treatment knowledge	26,47	0.26
Responsibility for e-healt management	13,86	0.14
Availability of information creating knowledge, improved communication	25,67	0.25
High awareness among patients	29,37	0.28
Strengthened cooperation in the field of applied treatments	4,62	0.07
Total score	Σ = 100	Σ = 1

Table 5. Weighted averages for the Servqual analysis.

Feature Category	Indicator Weight Σ = 1	Servqual Average for Each Feature Category	Weighted Average
Online treatment knowledge	0.26	0.38	0.20
Responsibility for e-healt management	0.07	0.05	0.01
Availability of information creating knowledge, improved communication	0.25	0.45	0.28
High awareness among patients	0.28	0.34	0.22
Strengthened cooperation in the field of applied treatments	0.14	0.01	−0.04
Weighted average sum of five areas			0.6
Total weighted average Servqual Sum of weighted averages for the areas under study/5			$\frac{0.6}{5} = 0.12$

The conducted analysis leads to the creation of a diagram of the causes of problems and the benefits of smart e-health. On the basis of the developed research results, a schematic empirical model was prepared containing elements determining the problems and benefits of online treatment. The elements were divided into technical, social and economic categories. The model is shown in Figure 4.
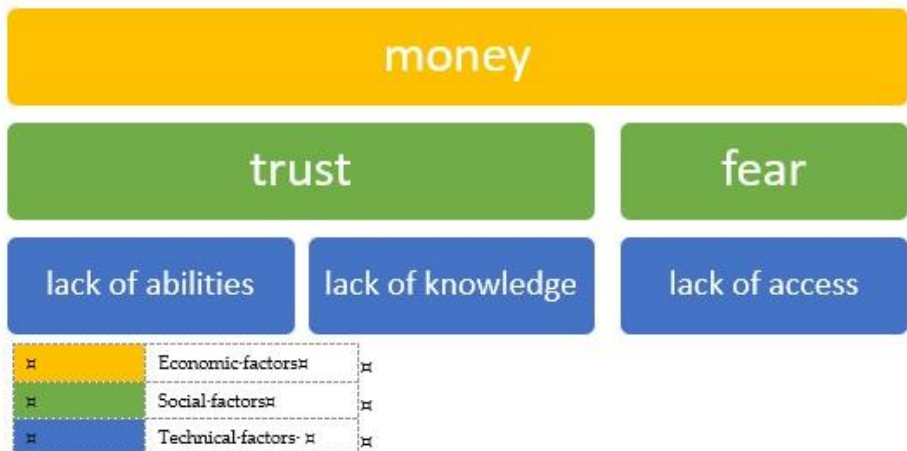
Figure 4. The model describing the problems and benefits of online treatment

Higher level of knowledge and greater involvement of patients in their own health and treatment are of great importance. Involving different treatments and therapies does not guarantee health for everyone and has many limitations. Older generations may find it difficult to use applications or make online appointments, but a change in thinking and behavior is essential. Due to the growing availability of modern systems that create the smart e-health culture, the development of awareness, skills and the fight against search engine treatment is essential.

5. Discussion and conclusions

The study had several limitations. First, although it was wide-ranging and involved patients, respondents could have a variety of motives and health conditions. Additionally, although there was a comparison with the existing literature on user retention and satisfaction with online treatment options, there is a lack of extensive research on patient awareness. There is also a lack of a breakdown into age groups, most often research focuses on a specific solution or a given disease as the basis of building a research group. Future work examining this, in addition to the level of awareness, will examine the effect on health and divide the respondents into age groups.

It was vital to make adjustments in the medical services industry at a time when societies are ageing at an alarming rate, and hospitals and public institutions are unable to absorb patients (Shaheen, 2004). Modern health technology has been employed to take effective measures leading to patient care and access to a specialist. The purpose of the modern approach to raising patient awareness and providing new opportunities to support the battle against sickness and self-healing via the Internet is to integrate these elements.

The findings are illuminating, revealing widespread illiteracy, a lack of information,

and a fear of taking drugs without contacting a doctor. Future research on the subject of this article should concentrate on:

- the adaptation of smart e-health management methods for different age groups,
- knowledge and social campaigns to help patients acquire skills,
- activities to better prepare the younger generation to use smart e-health services, and the inclusion of sustainable development in educational programs.

The results of qualitative and quantitative research on treatment and therapy in terms of distance and modern instruments utilized in the investigated nations are presented in this article. The employment of specific approaches was linked to the fact that quantitative research allows for the creation of a broad picture of the research topic. Qualitative research, on the other hand, allows you to obtain additional understanding about the identification of the components associated with the investigated areas and their relationships. The survey's preparation also necessitated the acquisition of specialized knowledge, as well as the identification and comprehension of certain components and their relationships (Simon, 2016; Menvielle et al., 2017a). This necessitated the application of qualitative research methods. Quantitative research allows for generalizations, but qualitative research based on the principle of ethnographic study allows for a greater grasp of the intricacies of the phenomena. The application of research is inextricably linked to the emergence of unique issues and limits. The inability to compare the data to another research period was a weakness of this study. The authors decided that this could be a viable research topic for the future and plan to perform a comparison study within the next 2-3 years.

Knowledge is a factor that promotes or supports trust in smart e-health. Its level and flow are directly tied to trust and the ability

to employ a variety of technologies. The idea that an increase in knowledge raises the amount of trust in alternative solutions was confirmed in this study. Consumers can gain knowledge and behavioural skills in a certain sector over time if they have trust. Keep in mind that trust is simpler to establish using countable and quantifiable criteria in a typical face-to-face setting. The situation is a little more complicated here because trust is about health, which is a priceless commodity that is vital to all of us. We can spend a lot of resources to rescuing them because of their value. It takes a long time and a lot of effort to earn someone's trust (Rosak-Szyrocka, 2018). The validation of the second hypothesis, that modern technologies enable "extra" access, is likewise a significant finding. Although there is a willingness to try new ways, the lack of understanding about how to apply them leads to the challenges mentioned in the study.

After carrying out the study in a number of nations, it has been determined that the most serious issue is self-treatment, which includes taking prescriptions from people who have similar symptoms or generating diagnoses using search engines on the internet. Patients must develop a high level of social awareness and a readiness to learn new things. In all of the countries surveyed, the degree of trust is adequate, but it is directly proportional to the amount of knowledge and readiness to learn new things in this field. Furthermore, a qualitative study in which respondents were asked to remark on their future needs revealed that they lack a health management culture, which is revealed in this study to be a critical element for patients.

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