THE IMPORTANCE OF INDIVIDUAL BENEFITS – UNDERSTANDING PATIENT BEHAVIOUR IN E-HEALTH ADOPTION

VAŽNOST INDIVIDUALNIH KORISTI – RAZUMIJEVANJE PONAŠANJA PACIJENATA U USVAJANJU USLUGA E-ZDRAVLJA

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Abstract

Purpose – Advancements in telemedicine offer the potential to enhance healthcare efficiency, accessibility, quality, and environmental impact. However, the shift from traditional interpersonal healthcare to technology-mediated services necessitates a nuanced understanding of the factors influencing patient behavior.

Design/Methodology/Approach – This research study extends the Technology Acceptance Model (TAM) to examine telemedicine adoption patterns. Beyond conventional TAM elements such as a positive attitude and technological readiness, the investigation scrutinizes the influences of social and individual benefits, alongside the impact of COVID-19 anxiety, specifically within the Central and Eastern European context. This methodological expansion and regional focus provide unique insights into the research domain. Utilizing regression analysis on data collected through an online survey, the study highlights the substantial influence of individual benefits and positive attitudes on the adoption of telemedicine technologies.

Findings and implications – Perceived social benefits do not exhibit a statistically significant effect. These

Sažetak

Svrha – Napredak u telemedicini nudi potencijal za poboljšanje učinkovitosti zdravstvene zaštite, pristupačnosti, kvalitete i utjecaja na okoliš. No prijelaz s tradicionalne interpersonalne zdravstvene skrbi na usluge posredovane tehnologijom zahtijeva nijansirano razumijevanje čimbenika koji utječu na ponašanje pacijenata.

Metodološki pristup – Istraživanje proširuje Model prihvaćanja tehnologije (TAM) kako bi se ispitalo obrasce usvajanja telemedicine. Osim konvencionalnih elemenata TAM-a kao što su pozitivan stav i tehnološka spremnost, istraživanje pomno ispituje utjecaje društvenih i individualnih koristi, zajedno s utjecajem anksioznosti od bolesti COVID-19, posebno u kontekstu srednje i istočne Europe. Ovo metodološko proširenje i regionalni fokus pružaju jedinstvene uvide u istraživačku domenu. Koristeći regresijsku analizu podataka prikupljenih putem anketnog upitnika online, istraživanje naglašava značajan utjecaj individualnih koristi i pozitivnih stavova na usvajanje tehnologije telemedicine.

Rezultati i imlikacije – Percipirane društvene koristi ne pokazuju statistički značajan učinak. Ovi rezultati naglašavaju potrebu za prilagođenim inicijativama za

findings emphasize the need for tailored awareness initiatives that underscore the personal advantages of e-health solutions while addressing prevalent skepticism surrounding technology.

Limitations – The findings are limited by the representativeness of the sample, as it over-represents young, educated women, urban residents, and individuals with a higher socioeconomic status.

Originality – The insights derived from this study contribute to the growing body of knowledge aimed at facilitating a seamless integration of telemedicine technologies into healthcare frameworks within the targeted region.

Keywords: e-health, technology acceptance model, technological readiness, COVID-19 anxiety

podizanje svijesti o osobnim prednostima korištenja usluga e-zdravlja, dok je istovremeno potrebno prevladavanje skepticizma povezanim s tehnologijom.

Ograničenja – Rezultati su ograničeni (ne)reprezentativnošću uzorka jer su u njemu više zastupljene mlade, obrazovane žene, urbano stanovništvo i pojedinci s višim socioekonomskim statusom**.**

Doprinos – Istraživanjem dobiveni uvidi pridonose rastućoj količini znanja usmjerenog na olakšavanje besprijekorne integracije tehnologije telemedicine u okvire zdravstvene skrbi unutar ciljane regije.

Ključne riječi: e-zdravlje, Model prihvaćanja tehnologije, tehnološka spremnost, anksioznost uzrokovana bolesti COVID-19

1. INTRODUCTION

Growing application of information and communication technologies (ICT) has transformed the healthcare system in the 21st century (Jung & Loria, 2010). With leveraging ICT capabilities, e-health still shows promise in improving patient care, reducing costs, and increasing revenues while also making patients well-informed about their health (Jung & Loria, 2010). It streamlines healthcare processes by enabling the evaluation and exchange of health data through digital platforms (Kwankam, 2004). This data contains past diagnoses and prescriptions and can be accessed from anywhere and anytime online.

During the recent pandemic, e-health emerged as a pragmatic and effective solution for supporting both patients and healthcare providers (Smith et al., 2020). It provided significant support in addressing the psychological challenges originating in the isolation during COVID-19 while also facilitating access to healthcare services and information (Pappot, Taarnhøj & Pappot, 2020). Particularly in the realm of cyberspace, e-health mitigates the impact of geographical distance, which is crucial not only during a pandemic but also during everyday healthcare scenarios.

E-health services are above expected technological advancements in a lot of aspects; they include content, connectivity, commerce, community, and clinical care at the same time (Eysenbach, 2001). E-health platforms can gather, organize, interpret, and utilize clinical data, hence managing outcomes and assessing care quality (American Medical Association, 2018). A substantial rise of health applications tailored for smartphones has become a visible trend recently. These applications demonstrate e-health in a very versatile and accessible way. Serving as a user-friendly gateway, they are also an easy-to-use tool for individuals with limited computer literacy or elderly patients (Demiris, Finkelstein & Speedie, 2001). Yusif, Hafeez-Baig, and Soar (2020) highlight that e-health, promoted through the internet and telecommunication using digital devices, disseminates and oversees health information for and by healthcare providers and recipients, as well as policymakers. In this study, e-health stands for health services and information circulated via online technologies.

Involving a huge number of stakeholders with diverse backgrounds, experiences, and values, e-health stands out as a complex social system, requiring a thorough understanding of perspectives of users and patients (Tebeje & Klein, 2021). This study focuses on examining factors that shape the adoption of e-health services among patients. Building on well-established technology acceptance models, the research attempts to expand its scope by including novel elements including perceived social, personal, and individual benefits of e-health services, along with considerations of COVID-19 anxiety. Furthermore, this study not only examines the willingness to experiment and actual usage but also delves into long-term usage intention and overall satisfaction with e-health. Moreover, it offers insights into the determinants of e-health adoption within the Central and Eastern European (CEE) context, where e-health was relatively underutilized before the pandemic, hence enriching the existing knowledge base.

2. LITERATURE REVIEW

Numerous theoretical models focused on anticipating and evaluating technology acceptance and behavior, among which the Technology Acceptance Model (TAM), developed by Davis in 1986, is one of the most prominent (Davis, Bagozzi & Warshaw, 1989; Davis 1986). Building on behavioral purpose, perceived usefulness, and perceived ease of use, TAM serves as a robust framework for forecasting and explaining user behavior across different contexts (Hu, Chau, Sheng & Tam, 1999; Borges & Kubiak, 2016).

TAM postulates that individuals' perceived usefulness (PU) and perceived ease of use (PEOU) of technology significantly affect their behavioral intention (BI) to utilize the technology (Wilson

& Lankton, 2004). However, it is crucial to note that the measures of behavioral intention may not consistently align with actual behavior due to the dynamic nature of intentions, which can fluctuate before behavior enactment (Sheeran, 2002). The difference between intentions and actual behavior, termed the intention-behavior gap, delineates the level of inconsistency (Bhattacherjee & Hikmet, 2007).

Based on the definition of Davis et al. (1989), PU reflects the degree to which an individual believes that using a certain system would improve their job performance. Building on the same work, PEOU is expected to have an impact on such perception. This suggests that the easier it is to use a technology, the more valuable it becomes (Davis et al., 1989, p. 985).

Perceived ease of use, as defined by the same authors, estimates the extent to which an individual perceives using a certain system is possible with minimal attempt (Davis et al., 1989, p. 987). Studies on the widespread application of information technology suggest that the ease of use of the system correlates with the ability of individuals to engage with it relatively effortlessly, therefore strengthening technology acceptance (Purwanto & Budiman, 2020). PEOU functions as a process of anticipation, with PU as an outcome of such anticipation (Sun & Rau, 2015).

2.1. Technology acceptance models in e-health

The integration of novel technologies is widespread in the world of healthcare services, with the recent ICT being acknowledged for its potential to increase service quality (Blackwell, 2008). The Technology Acceptance Model (TAM) serves as a fundamental framework for comprehending technology adoption among both clinical staff and patients, extending its application to the development and implementation of health information systems (Rahimi, Nadri, Afshar & Timpka, 2018). In explaining perceptions and behaviors of patients regarding e-health, TAM has an important role. It helps in identifying factors that influence the integration of information technologies into the e-health system (Ahlan & Ahmad, 2015; Garavand et al., 2016).

Conducted by Rahimi et al. (2018), a systematic review of TAM in e-health revealed a predominant focus on telehealth, electronic health records, and mobile applications. Looking at different user groups, physicians and nurses represent the primary subjects of investigation (32 and 25 percent, respectively), while patients account for 13% of the studies.

Whether TAM sufficiently captures the distinctive features of e-health has been argued widely within the e-health domain, given tht its original development is not specifically meant for healthcare settings (Holden & Karsh, 2010). The core TAM framework considers only two variables in determining behavioral intention (Choi, Kim & Kim, 2010), which potentially limits its applicability within e-health contexts (Liu, 2010). Thus, there is a strong necessity to broaden and integrate TAM with further constructs to improve its explanatory and predictive capacities regarding acceptance behavior (Holden & Karsh, 2010).

To gain a comprehensive understanding of how e-health features influence user satisfaction, it is essential to accurately assess a cohesive set of beliefs and attitudes. This evaluation should include relevant mediating factors related to behavioral beliefs and attitudes, as outlined in the TAM (Wixom & Todd, 2005). Contextualized versions of TAM have been developed, integrating context-specific variables to optimize particular dimensions of the model and improve the predictive power within e-health settings (Rahimi et al., 2018).

Lai, Larson, Rockoff, and Bakken (2008) introduced a new framework built upon the modified TAM to investigate the acceptance of Tailored Interventions for the management of Depressive Symptoms (TIDES) program. Additionally, Liu, Tsai, and Jang (2013) focused their attention on the acceptance of an online personal health record system, incorporating the physician-patient relationship (PPR) structure

into the TAM framework. Despite these expansions, it is worth noting that the perceived usefulness and perceived ease of use, as outlined in the TAM framework, persist as the two primary factors influencing the adoption of e-health, as emphasized by Gagnon et al. (2012).

In Bangladesh, the emphasis on adopting e-health highlights a critical significance of the perceived ease of use factor (Hoque, Bao & Sorwar, 2017). This has also been mentioned repeatedly in research on the recognition of monitoring technology for diabetes, supporting the claim that perceived ease of use substantially influences technology acceptance (Borges & Kubiak, 2016). Investigations into the adoption of health service applications in developing countries show that perceived usefulness has a significant effect on individuals' acceptance and use of technology (Faqih & Jaradat, 2015).

For the purpose of further empirical analysis, a study authored by Nazari-Shirkouhi, Badizadeh, Dashtpeyma, and Ghodsi (2023) used survey data of Iranian hospitals which are providing e-services to examine results regarding the user acceptance of e-health services. This paper has also used the TAM model as the basis for analysis. Measuring both direct and indirect influence, the authors found that out of their eight variables, seven positively affect the willingness to use e-services. Namely, these are computer literacy, website quality, service quality, perceived enjoyment, perceived ease of use, user satisfaction, and perceived usefulness. In contrast, they did not find any correlation between user attitude and the willingness to use e-services (Nazari-Shirkouhi et al., 2023).

Alsyouf et al. (2023) chose yet another aspect of using the TAM model to analyze patient behavior focusing on the role of privacy, security, and usability. Conducting survey with around 400 Saudi Arabian respondents, the study aims at investigating the relationship between the use of personal health records (PHRs) and privacy, security, and usability. According to the results, the intention to use PHRs is directly influenced by security. Furthermore, privacy and usability had a positive moderating effect on the relationship between perceived ease of PHR use and intention to use PHR.

Although not set in a developing country, an empirical study of Holtz, Mitchell, Hirko, and Ford (2022) based on TAM examined rural households in the United States (specifically, in Northern Lower Michigan). The findings confirmed TAM as a useful model for comprehending the attitudes towards telemedicine that could encourage rural Americans to use it (Holtz et al., 2022).

After examining the theoretical foundations of e-health and TAM, scholars recommend the development of new constructs that are customized to particular contexts. Thus, various extended TAM models have been utilized to investigate the acceptance of e-health.

2.2. E-health in COVID-19

Since the onset of the spread of the coronavirus disease worldwide in 2019 (COVID-19), healthcare providers have increasingly adopted e-health solutions to reduce infection risks and address emerging challenges. As a result, numerous clinical care facilities in affected regions ceased physical operations, trying to move patient interactions to e-health platforms (Wind, Rijkeboer, Andersson & Riper, 2020). Wind et al. (2020) characterize COVID-19 as a "black swan" event that has induced a widespread acceptance of e-health among both healthcare professionals and patients, encouraging a symbiotic relationship. In response to the COVID crisis, many countries eased their regulations relating to e-health, launching the services for screening, triaging, and remote monitoring (Pappot et al., 2020).

Hong, Lawrence, Williams, and Mainous (2020) explored the population-level interest in e-health during the COVID-19 era, finding an increased interest in the U.S. coinciding with spikes in COVID-19 cases. Research conducted during the pandemic clearly emphasized the psychological challenges due to COVID-19-induced isolation. Duan and Zhu (2020) examined

the Chinese public health emergency system in the context of the COVID-19 outbreak, promoting the establishment of a mental healthcare system that incorporates e-health solutions to effectively cope with psychological issues. Elahi, Liang, Malik, Dilawar, and Ilyas (2021) expanded traditional technology acceptance models to incorporate the element of COVID-19 anxiety into the framework. Their findings show a positive correlation between COVID-19 anxiety and patients' attitudes to e-health services, confirming and highlighting the constructive role of COVID-19 anxiety in encouraging their acceptance.

More recent studies regarding the openness of the general public towards e-health in relation to COVID-19 have also shown positive correlation between the pandemic and interest in innovative healthcare approaches. For example, Hassan & Davies (2024) have found e-health tools to contribute to improving the health literacy of patients. Based on the interviews and surveys of the study, convenience and user empowerment turned out to be the most prominent reasons for using e-health services, with "the lack of cooperation between technology providers" and "the lack of quality filter and complicated procurement pathways" being mentioned by the respondents as the main weaknesses of e-health services (Hassan & Davies, 2024, p. 727). Other recent studies drawing a link between the pandemic and e-health service usage include Patel et al. (2023), who found that patients were more open to using a particular mobile app to track their symptoms. Furthermore, based on an online survey done in Iran, Galavi, Khajouei, and Jahani (2023) similarly found a positive relation between e-health services and people's interest in and knowledge of COVID-19 prevention.

3. METHOD

In the fall of 2021, a convenience sampling method was employed to conduct an online questionnaire survey, aimed at investigating the determinants that influence the adoption of e-health services in a CEE country, specifically Hungary. The survey focused on assessing the status and awareness of e-health in the nation, as well as the ICT skills and opinions of the respondents. Additionally, demographic determinants and concerns related to the coronavirus disease were included as factors under investigation. A summary of the key features of the people who participated in the survey is provided in Table 1 below.

TABLE 1: Demographic features of the sample (N = 302)

	Number of respondents (individuals)	Distribution of respondents (%)
Gender of respondents		
Male	70	23.2
Female	232	76.8
Age group		
18 years or younger	5	1,7
19-35 years	152	50.3
36-54 years	99	32.8
55 years or older	46	15.2
Income/financial wellbeing		
Below average	21	7
Average	231	76.5
Above average	50	16.5
Have children?		
Yes	152	50.3
No	150	49.7
Place of residence		
Village	47	15.6
Town	63	20.8
City	84	27.8
Capital	104	34.5
Other	4	1.3
Education		
High school or less	131	43.4
University/college	162	53.6
PhD	9	3

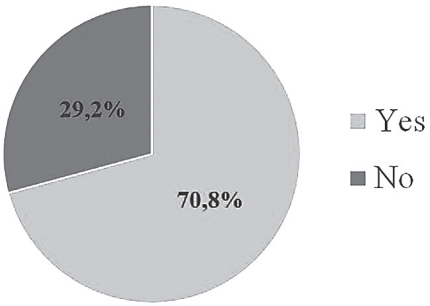
Source: Data based on authors' own analysis.

Most respondents identified as female (76.8%), with 56.6% having at least a university degree. The mean age of respondents was 38.4 years, with a standard deviation of 15.1 years. According to the Central Statistical Office (KSH, 2021), in 2021 the gender ratio of the population was roughly the same in all age groups (49-51%, women being the majority), while the average age was 42.9.

Regarding the place of residence within the county, 12.6% of respondents live in a village, 22.8% in a small town, 29.1% in a big city, and 35.4% in the capital. There was at least one respondent from every county except the Tolna County (average 13.11 respondents per county, median 6.5). The majority of respondents (76.5%) consider themselves to be in an average financial situation in Hungary, with an average gross income of 433.700 Hungarian Forints (KSH, 2021), while 16.4% identify themselves as above average, and 7% below average.

Furthermore, 70.8% of the participants indicated their awareness of e-health (Figure 1), but only 53% reported having used its services.

FIGURE 1: Awareness of e-health by participating individuals (N=302)



Source: Data based on authors' own analysis.

The Electronic Health Service Space (called EESZT in Hungary) was the most frequently accessed service, with a utilization rate of 71.7%. It was followed by e-mail consultation, with a share of just 37.7%, and visual-enabled virtual medical consultation at an even lower rate of 32.7%. The levels of satisfaction with the last service received were rated on a scale ranging from 1 ("not at all satisfied") to 7 ("completely satisfied"), as shown in Table 2 below.

TABLE 2: Satisfaction with the most recent e-health service used (N=160) (1 – not at all satisfied; 7 – completely satisfied)

Type of service	Obs.	Mean	St. dev.	Min.	Max.
Supported by photo	24	5.58	1.66	1	7
Video teleconsultation	9	5.56	1.59	3	7
E-mail consultation	24	5.83	1.37	3	7
EESZT	83	5.81	1.48	1	7
Digital device	7	5.57	1.51	3	7

Table 3 provides descriptions of the model concepts. Using the average score method, constructs earmarked for examination were obtained from the collected responses. Afterwards, empirical analyses were carried out employing both linear and logistic regressions.

TABLE 3: Concepts used in the research and their operationalization

Concept (construct)	Source	Number of indicators
Technological readiness	Leung & Chen, 2019	4 indicators
Fear (mistrust)	Own concept	7 indicators
COVID-19 anxiety	Own concept	1 indicator
Individual benefits	Own concept	7 indicators
Intention to use	Venkatesh & Davis 2000	1 indicator
Usage of e-health	-	Dummy variable
Willingness to try	Own concept	1 indicator
Social benefits	Own concept	3 indicators
Positive attitude	Venkatesh & Bala, 2008	7 indicators
Satisfaction	Own concept	1 indicator

Source: Data based on authors' own analysis, Leung & Chen (2019), Venkatesh & Davis (2000), Venkatesh & Bala (2008).

The *Technological readiness* construct includes perceptions of technology and smart gadgets, while *Fear (mistrust)* quantifies the extent of technophobia. A positive attitude indicates that an individual is receptive to technological innovation and to e-health in general (Venkatesh et al., 2003).

The *Willingness to try* variable estimates the individual's willingness to experiment with the service if telediagnostics were available, while *Intention to use* shows the individual's readiness to fully switch to telediagnostics.

Individual benefits and *social benefits* measure the perceived personal and societal advantages anticipated from e-health services. *Satisfaction* shows the subjective assessment of services by individuals who have tried and used e-health services, while *Coviid-19 anxiety* measures the degree to which e-health eases the fear of infection or spread of disease.

Plus, the variables include a binary variable showing the usage of e-health, assessing awareness of e-health services using the question "Have you ever used e-health services?! with an output of 0 for no and 1 for yes.

The following hypotheses were formed building on the constructs outlined in Table 3:

H1: COVID-19 anxiety is postulated to positively impact willingness to try, intention to use e-health, and satisfaction with current e-health services.

The concerns associated with the widespread dissemination of the coronavirus significantly influence both performance expectations and the inclination to embrace e-health solutions (Meuter, Ostrom, Bitner & Roundtree, 2003; Venkatesh, Morris, Davis & Davis, 2003). Given that the COVID-19 anxiety construct primarily relates to infection prevention, encompassing both the drive to utilize e-health services and the assurance in avoiding contagion, a positive correlation is theorized between COVID-19 anxiety and disposition toward e-health/telediagnostics (Wilson & Lankton, 2004; Jung & Loria, 2010; Bandura, 1986).

H2: Apprehension regarding the services provided by online healthcare is expected to negatively impact willingness to and the intention to use telediagnostics, as well as satisfaction with current e-health services.

It is a natural response to fear uncertainty (Çelik, 2011), and the anticipated performance and intention to use e-health is predicted to be negatively impacted by quasi-technophobia.

H3: Technological proficiency is posited to positively affect the intention to use and willingness to try telediagnostics.

Technological proficiency indicates the effort required by an individual to effectively use a new Information and Communication Technology (ICT) technology. Research by Melas, Zampetakis, Dimopoulou, and Moustakis (2011), Venkatesh et al. (2003), and Keszey and Zsukk (2017) argues that technological proficiency, along with ICT skills, correlates with the Perceived Ease of Use (PEOU) of e-health systems.

H4: Perceived individual benefits are expected to have a positive impact on the willingness to try, intention to use telediagnostics, and satisfaction with the service.

Drawing from the investigations of Venkatesh et al. (2003), Abd-alrazaq et al. (2019), and Tavares, Goulão and Oliveira (2018), it is postulated that a favorable association exists between individual anticipated benefits (performance expectancy) and the readiness to experiment with or adopt a service. Furthermore, an equivalent construct was devised to appraise the role of social benefits, particularly examining whether perceived social utility impacts the perception of the service.

H5: Positive attitudes are assumed to increase the intention to use, willingness to try e-health, and satisfaction with current e-health services.

Various research studies have found a significant correlation between positive attitudes and the adoption of and experience with emerging technologies (Lin & Chang, 2011; Hussein, 2017; Yang & Yoo, 2004). As assumed, a comparable correlation between positive attitudes, the intention to try, and the readiness to use telediagnostics is also expected. This hypothesis implies that positive attitudes are expected to exert a positive influence on satisfaction as well.

4. RESULTS

Building upon the previous chapter, the database was constructed using the average score method to identify the constructs scheduled for examination, which were derived from the collected responses. In addition, demographic variables were integrated. The analysis of the obtained results was segmented into three components. Firstly, an Ordinary Least Squares (OLS) model was employed to explore the impact of the listed explanatory variables on the willingness to try and the intention to use. Secondly, a logistic regression (logit) model was used to investigate the crucial determinants influencing individuals who have already engaged with a service within e-health. Lastly, the third part employed an OLS model to assess the influence of constructs and demographic variables on satisfaction.

4.1. Impact of elements on the readiness to experiment and the intention to utilize.

The analysis of this section is focused on how the established constructs and demographic variables influence the intention to use and willingness to try telediagnostics by the respondents. It is important to highlight that numerous variables were found to be statistically insignificant. As a result, the final models were constructed as follows:

$$WillingnessToTry = \beta_0 + \beta_1 Attitude + \beta_2 Fear + \\ + \beta_3 Ind.\,Benefits + \beta_4 CovidAnxiety + \beta_5 Age$$

and

$$IntentionToUse = \beta_0 + \beta_1 Attitude + \beta_2 Ind.\,Benefits + \\ + \beta_3 CovidAnxiety + \beta_4 TechnologicalReadiness + \\ + \beta_5 Age + \beta_6 Gender$$

The results are shown in Table 4 below.

TABLE 4: Results of the regression. Outcome variables: Willingness to try and Intention to use

Independent variables	Willingness to try	Intention to use
Positive attitude	0.341*** (0.074)	0.370*** (0.087)
Fear	-0.28*** (0.07)	-
Technological readiness	-	-0.163** (0.077)
Individual benefits	0.371*** (0.077)	0.473*** (0.080)
COVID-19 anxiety	0.160*** (0.043)	0.173*** (0.043)
Gender (dummy)	-	0.580*** (0.18)
Age	0.011*** (0.004)	0.015** (0.006)
Constant	1.366*** (0.465)	-1.126** (0.489)
N	302	302
R^2	0.6023	0.5342
Standard errors	robust	robust

Note: *p < 0.1; **p < 0.05; ***p < 0.01

Source: Data based on authors' own analysis.

The results indicate that a strong motivation to avoid coronavirus infection significantly influences the willingness to try telediagnostics. Specifically, the age of respondents stands out as a significant and important factor, suggesting that despite the possible reluctance to use novel technology, the older generation is substantially impacted by the pandemic and more motivated to experiment with telediagnostics. Also quite surprisingly, technological readiness does not have a significant influence, suggesting that proficiency with technology may not be a decisive factor in the long term, especially considering the potential of telediagnostics as a primary option. Although a positive attitude and perceived individual benefits positively affect the willingness to try, technophobia has a rather negative impact. Overall, the individuals who are receptive to the service, anticipate personal benefits, and those who part of the older generation are more inclined to experiment with telediagnostics. Conversely, skepticism and distrust of e-health tend to decrease the likelihood of adoption.

Likewise, the intention to use telediagnostics in the longer term reflects comparable trends. It is more likely that a respondent will complete transition as expectations of personal benefits increase and as the respondent becomes more open to e-health in general. While technophobia loses its significance, technological proficiency (which has a negative effect) and gender (specifically, women being less inclined to switching) turns out to be more relevant. The former may be affected by social factors discussed more thoroughly in the following subsection.

4.2. Determinants impacting the practical utilization of e-health

This study applied a logit model (using robust standard errors) to determine the independent variables – including constructs and demographic variables – which affect respondents in their actual usage of currently accessible e-health services. Nevertheless, specific demographic determinants (including, surprisingly, age) did not produce statistically significant results, resulting in the final model outlined below:

$$Logit(Usage) = \beta_0 + \beta_1 TechnologicalReadiness + + \beta_2 Fear + \beta_3 Gener + \beta_4 Child$$

where *Logit(Usage)* is the outcome variable (*"Have you utilized any e-health services before?" – Y/N*).

Table 5 below provides the results.

TABLE 5: Results of the regression (outcome variable: Have you utilized any e-health services before?)

Variables	Risk ratio
Technological readiness	1.472*** (0.151)
Fear	0.750*** (0.081)
Gender (dummy)	2.306*** (0.667)
Child (dummy)	2.367*** (0.637)
Constant	0.112*** (0.085)
N	302
Standard errors	robust

Note: *p < 0.1; **p < 0.05; ***p < 0.01

Source: Data based on authors' own analysis.

The risk ratio was employed to assess the probability of two events occurring. While ratios above 1 stand for a higher probability of the event, those below 1 imply a lower likelihood as the predicting variable increases. Building on the results, the following findings are possible:

1. The inclination of respondents to explore e-health services correlates with increased familiarity with technology.
2. Women, compared to men, turned out to be less motivated to experiment with e-health services.
3. A greater likelihood to try e-health services was found in the case of people with as compared to respondents without children.
4. Respondents with less confidence in technology and e-health were found to be less likely to try e-health services.

However, it is worth mentioning that while the survey was conducted during the COVID-19 pandemic, this does not mean that respondents who tried e-health services have necessarily encountered them only during the outbreak COVID-19. Questions related to telediagnostics (intention and willingness to try) predominantly focused on the pandemic, while questions about ongoing service trials were more reflective of the pre-pandemic period.

It can be clearly seen that in the case of individuals who already had experimented with e-health services, COVID-19 anxiety and positive attitude were not identified as significant determinants; however, technological readiness was found to be an important factor. Result tracking and prescription triggering are great examples of the tasks made available by the EESZT system (established in 2017), visual-assisted telehealth facilities, and digital medical equipment. On the other hand, the utilization of such tasks was not clearly set. Before COVID-19, the adoption of telemedicine services may have been more reliant on technical proficiency than on a positive attitude, possibly due to their complexity. These results correspond with the observation that women, who tend to be less technologically proficient, were found to be less likely to have tried an e-health service. In addition, it is reasonable to draw the conclusion that parents were found more likely to try e-health services compared to those without children. This inclination can be attributed to the convenience of managing prescriptions through EESZT or consulting a physician via email, especially when addressing the healthcare needs of children.

4.3. The impact of constructions on satisfaction

This part of the research study investigates how the constructs and demographic variables affected the contentment (Satisfaction) of individuals who had utilized online health services before. As previously found, numerous variables did not turn out to be significant, therefore no demographic variables were included in the final model, nor were Social benefits, Individual benefits, and Technological readiness. Hence, the simplified final model looks as follows:

$$Satisfaction = \beta_0 + \beta_1 Attitudes + \beta_2 Fear + \\ + \beta_3 CovidAnxiety$$

The findings are presented in Table 6 below.

TABLE 6: Results of the regression (outcome variable: Satisfaction)

Independent variables	Satisfaction
Positive attitude	0.348*** (0.077)
Fear	-0.223** (0.086)
COVID-19 anxiety	0.115** (0.051)
Constant	4.252*** (0.525)
N	160
R^2	0.3511
Standard errors	robust

Note: **p < 0.05; ***p < 0.01

Source: Data based on authors' own analysis.

The model findings indicate that satisfaction was positively affected by maintaining a favorable attitude toward the experiment, a rational outcome, and perceiving it as a means to mitigate the risk of contracting the coronavirus—potentially a subsequent effect but logical nevertheless. In contrast, apprehension regarding the services significantly impacted the assessment of the service, which is also rational, as individuals lacking trust in the system are unlikely to be persuaded by the complex and challenging-to-use EESZT.

5. DISCUSSION AND CONCLUSIONS

The results indicate a positive influence of COVID-19 anxiety on the willingness to try telediagnostics, intention to use it, and satisfaction with current online health services, thereby confirming Hypothesis H1. Notably, the adverse impact of mistrust in e-health and technology has also been substantiated (Hypothesis H2), with a higher coefficient in both cases. This indicates that mere anxiety related to the coronavirus is insufficient to beat technophobia. However, distrust of technology and e-health does not seem to impact the intention to use. This distinction may be accounted for by the fact that the intention to use involves a total transition to telediagnostics, whereas the intention to try is a one-time effort, requiring a different level of commitment. In the former scenario, the absence of direct interaction with physicians may transform the process into something less personal, potentially compromising the patient-doctor relationship and trust. Studies have emphasized the significance of effective doctor-patient communication, empathy, emotional support, and simplified explanation of test results in enhancing patient satisfaction (Chen, Guo, Wu & Ju, 2020; Chandra, Mohammadnezhad & Ward, 2018; Korsch, Gozzi & Francis, 1968).

As a result, lack of trust in e-health and technology could not be substantial, and technological readiness had an adverse effect on the intention to use. This does not address primarily the technological deficiencies of the services but rather whether individuals would forgo the conventional, albeit rather personal, doctor-patient connection, significantly influencing satisfaction. Those more adept at technology who are familiar with online health services of Hungary, as revealed by the logistic regression model, were more inclined to have experimented with services such as EESZT. However, technological proficiency was linked with a negative indicator, indicating reluctance to relinquish the personal doctor-patient relationship. Therefore,

Hypothesis H3 must be rejected, as technological proficiency does not positively affect either the intention to use or willingness to try.

Consistent with existing research, positive attitudes significantly and positively affected the intention to use, willingness to try telediagnostics, and satisfaction with the experimented services, affirming Hypothesis H5. The positive effect of individual benefits on the intention to try and willingness to use (H4) aligned with the anticipation, while the predicted social benefits did not demonstrate significance across any models. This outcome is not surprising, considering that perceived social benefits have not been extensively reported compared to factors such as social pressure. Including the concept of perceived social pressure in future e-health research could prove beneficial.

It is evident that the apprehension and uncertainty stemming from the pandemic positively affected the perception of e-health and potentially heightened the willingness to adopt new technologies. Yet, relying solely on these factors is unlikely to foster broader acceptance or adoption of e-health. Distrust in technology appears to be a more pertinent factor, with positive attitudes and perceived individual benefits exerting a stronger positive impact. Therefore, launching awareness campaigns emphasizing the personal advantages of e-health in a clear and easily understandable manner could be beneficial in dispelling general technological distrust.

Furthermore, it is crucial to note that the sample does not adequately represent the demographics of the analyzed Central European country (Hungary), as a limitation of the study. The survey employed convenience sampling, resulting in a sample predominantly consisting of young individuals with a standard of living ranging from average to above average. In addition, the sample was overrepresented by women, individuals having higher education (53.6% in the sample, compared to around 29.3% in reality), those with children, and residents of the capital (while 34.5% of respondents live in Budapest, the actual share of its residents is approximately 18%). This could partially explain the reasons behind numerous demographic determinants (such as education, income, place of residence) not demonstrating significance. Future data collection should aim for a sample that is more representative across regions, age, and gender. On the other hand, investigating the impacts of perceived social pressure instead of social benefits could yield valuable insights. Additionally, exploring changes in e-health and perceptions of already accessible services nearly a year after the sample was collected and pandemic restrictions were eased could also offer valuable insights.

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APPENDIX 1

Short code	Description	N	Mean	Std. Dev
Positive attitude				
PA_1	I support the digitisation of medical services.	302	4.73	2.24
PA_2	I am the first in my circle of friends to try out new technologies.	302	3.42	1.99
PA_3	I often keep up with the development of technologies that interest me.	302	4.31	1.95
PA_4	I think I will like telemedicine.	302	4.14	2.14
PA_5	I think e-health is good overall.	302	4.26	2.12
PA_6	If I need to see a doctor, e-health could be an ideal solution for me.	302	3.88	2.15
PA_7	I believe I can trust the accuracy of the information I receive in the telemedicine system	302	4.47	1.84
Social benefits				
SB_1	E-health could make it easier for people with disabilities to access medical care.	302	5.05	2.04
SB_2	E-health could make it easier for people in remote small towns to get medical care.	302	5.17	1.99
SB_3	E-health could help elderly people get better access to medical care.	302	3.81	2.21
Individual benefits				
IB_1	E-health services – such as electronic medical records that are available online – can be useful to me.	302	6.13	1.52
IB_2	E-health improves the quality of healthcare.	302	4.78	2.03
IB_3	I will have easier access to healthcare professionals thanks to telemedicine.	302	4.77	2.05
IB_4	I will enjoy using telemedicine services.	302	4.22	1.94
IB_5	E-health will help me to shorten the waiting time at the hospital/clinic.	302	5.10	2.04
IB_6	E-health will help me to get to medical care more quickly.	302	4.72	2.09
IB_7	E-health will make it easier for me to plan when I go to the hospital/clinic.	302	4.90	1.92
Technological skills				
TS_1	I am not challenged by the use of digital technologies.	302	5.14	2.04
TS_2	I learn to use new technologies easily.	302	5.38	1.81
TS_3	It is not challenging for me to use a mobile phone, computer or tablet.	302	6.32	1.46
TS_4	The telemedicine system will be easy for me to use.	302	5.37	1.75
Fear of e-health and new technologies				
F_1	I fear that my data stored in the e-health platforms will be leaked.	302	2.96	2.08
F_2	I am wary of telemedicine services.	302	3.31	2.12
F_3	I fear that my data stored in the e-health system will be misused.	302	2.87	1.98
F_4	I fear getting the wrong diagnosis through the e-health system.	302	4.03	1.98
F_5	I think there is a risk to enter my data into the e-health system.	302	3.44	2.06
F_6	I think my data will not be treated confidentially in the e-health system	302	2.90	1.80
F_7	I think it takes too much time to learn how to use telemedicine services.	302	2.43	1.60