

DIGITAL TRANSFORMATION IN HEALTHCARE: AN ANALYSIS OF TELEMEDICINE AND PUBLIC POLICY

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Abstract Technology advancements and the rising need for more accessible, effective treatments drive a digital change in the healthcare sector. Adopting telemedicine enables remote consultations and treatments as essential elements of transition. The paper examines opportunities and challenges that telemedicine currently brings in healthcare ascertaining how public policy may encourage the use of telemedicine and best practices adoption to ensure efficacy, starting with a literature review on telemedicine status quo-definition, services provided, their advantages and disadvantages. The telemedicine current practices within healthcare industry are examined considering adoption rates, obstacles' use and economic effects. The paper also concentrates on the public policy role encouraging the telemedicine use, the legal and regulatory frameworks controlling it, policies and incentives promoting it too. The final of the paper outlines the best ways to deploy telemedicine, the use of technology for electronic health records, remote monitoring tools together with patients' participation and their education's significance. Overall, the paper grants a thorough examination of both opportunities and difficulties that telemedicine currently presents for healthcare, the role of public policy in promoting its adoption, and the implementation of best practices to ensure its effective use.

Keywords:
telemedicine,
healthcare,
digital
transformation,
public policy,
best practice

JEL:
I00, L38, D80, L86

1 Introduction

The COVID-19 pandemic imposed unprecedented pressure on healthcare realm, worldwide, causing saturated systems, logistical non-conformities, medical staff shortages, inadequate public management and ineffective crisis-related public policies (Pfefferbaum & North, 2020). This situation has revealed vulnerabilities in the public systems and called for innovative transformations to build resilience and promote better management of future crises. While further research is needed, this paper argues that smarter design of public policies can support the development of resilient human resources backed by technological adoption.

The impact of the recent pandemic has been far-reaching, affecting entire society besides the health sector. According to WEF's Global Risks Report 2021 (Schwab & Zahidi, 2021), perturbations generated the cancellation of important international events and significant economic losses in most industries. In response to the overwhelming demand for healthcare services, the sector has been forced to mobilize and innovate beyond its traditional boundaries, leveraging existing resources to save lives and mitigate economic losses. To better manage future crises, public policies should focus on building resilient human resources through the incorporation of technological advancements.

The COVID-19 pandemic has placed a significant strain on healthcare systems globally, leading to high alerts and full resource utilisation for emergency responses. The coordination and effective functioning of health systems have become critical international concerns to address the demand for medical services. This atypical crisis has required swift changes in various areas, including operation patterns, service prioritisation and care delivery, to combat the pandemic and restrain its consequences. With healthcare administration and patients gained experience in managing COVID-19, the focus still remains on reducing the pandemic devastating effects and providing higher quality to all services.

2 Literature Review

Telemedicine (TM) refers to the remote delivery of healthcare services (Sood *et al*, 2007) using telecommunication and digital technologies (Tedros, 2020). Over the years, TM use has increased being effective in providing remote care to patients with

chronic conditions, enabling access to specialised care and reducing the burden on healthcare facilities (Martinez et al., 2006) and the pandemic accelerated its adoption and integration into healthcare systems (Mihoreanu et al., 2022). Moreover, TM has the potential to improve health outcomes and patient satisfaction while reducing healthcare costs (Khan et al., 2021), expanding access to services and promoting care continuity.

The adoption of TM addressed some of the challenges faced by healthcare systems during the COVID-19 pandemic when it helped maintain social distancing, reduced the risk of infection, provided care to patients in quarantine or self-isolation (Gordon & Catalini, 2018), supported the management of the surge of patients seeking care.

The last pandemic has highlighted pre-existing weaknesses in the healthcare systems: repetitive routine, bureaucratic administration, ineffective workflows, lack of standardisation and deficient process optimisation. TM is included in telehealth (TH) but differs from it: it represents a broader application of technologies to support health services, a challenging solution with potential to standardise and automate tasks, referring to the remote exchange of medical information and/or services between patients and clinicians via electronic technology, a new coming complementary structure in the practice of medicine. Conceptually, TM relies on medical doctors rather than other healthcare professionals and is intended to: provide clinical support, improve health outcomes by overcoming geographical barriers, and use medical support instruments with patients to operationalise ICT (Hoffman, 2020). Tedros (2020) considers the TM purpose, mission and medical support as essentials instruments which only complements the classical medicine allowing for the provision of remote clinical services in critical situations where patients are isolated due to illness or physical/geographical unavailability (Tanțău et al., 2014). It can help reducing the spread of infection and prevent unnecessary visits to overcrowded or in crisis health facilities.

Despite the success of TM practice in other countries, its implementation in Romania has been limited: teleconsultations were used at 30% in the first pandemic year, less than the European mean of 39% due to various obstacles - methodological, financial, praxeological, regulatory issues together with concerns over liability for malpractice, issues related to reimbursement of medical service providers,

technological challenges, patient access to technology and training in using devices (Argyres et al., 2022). With a new regulatory framework as a unique opportunity to promote the use of TM services, the Romanian health authorities continue the efforts to facilitate the implementation of e-healthcare.

3 Analysis of the Digital Transformation in Healthcare

The adoption of technology has improved patient outcomes, increased efficiency and care quality. Digital transformation changes the societal fundamentals, including the healthcare sector: facilitating adoption of electronic health records (EHRs), enabling providers to access patient data remotely, sharing information across different facilities, improving patient safety, reducing medical errors, and streamlining healthcare processes. Increased collaboration will improve care coordination and reduce medical errors. Furthermore, TH emerged as a critical component of digital transformation in healthcare, enabled remote consultations, telemonitoring and TM (Bashshur et al., 2016). Innovation for medical devices, wearable sensors, has spurred allowing to monitor continuously patients' current health parameters, facilitating early detection of health problems (see Figure 1).

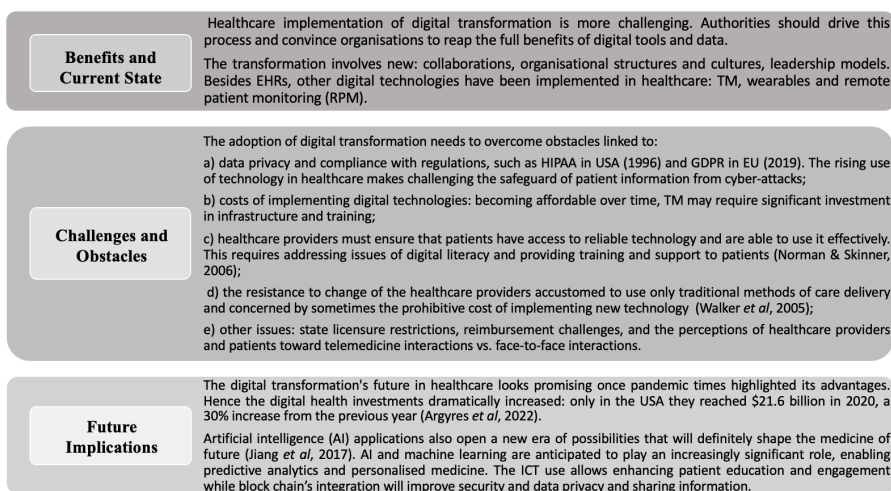


Figure 1: Theoretical aspects box

Source: Authors' elaboration adapted after Norman and Skinner (2006), Walker et al. (2005); Argyres et al. (2022) & Jiang et al. (2017)

RPM is combining digitally transmitted health-related data to improve patient care. Although it dates from the 90s, this concept was revived with COVID-19 pandemic, in order to treat chronic conditions (cardiovascular disease, diabetes, obesity, cancer care, speech language pathology, mental health, paediatric conditions *etc.*). High cholesterol, hypertension, weight management, insulin resistance, receiving chemotherapy- liked issues were addressed to improve health-related outcomes and reduce unnecessary health care costs. A systematic review on RPM (Farias FAC, 2020) shows increasing publications number between 2015-2018 (43%), with Wireless devices or smartphone apps being the most popular strategy (75.7%), with 17.6% of studies employing tele-education and 24.6% employing teleconsultation measures. Romania still has the opportunity to set up an e-Health system strategy development and optimise both data flow and actors' interaction, using a single electronic health records system across health system with EU funding.

4 Methodology

Methodological aspects box is outlined in Figure 2.

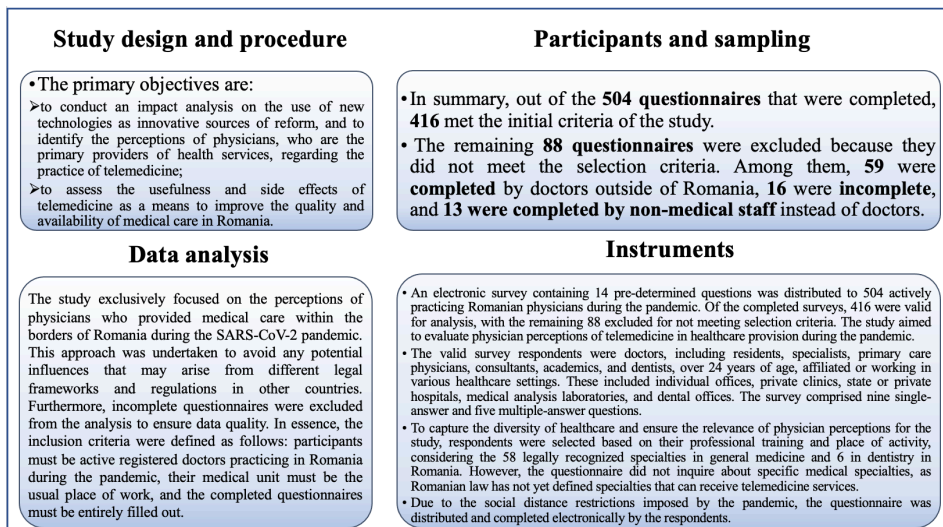


Figure 2: Methodological aspects box

Source: Authors' elaboration.

The current methodology comprises a four-stage investigation, delineated as follows: firstly, to ascertain the current state of knowledge pertaining to the medical care dispensed through telemedicine and the prevailing conceptual framework in the global and national domains of telemedicine during the pandemic; secondly, to design and administer a questionnaire to gather the opinions of physicians with respect to the use of telemedicine as a modality for healthcare delivery; thirdly, to analyze the accumulated data; and fourthly, to delineate the advantageous facets of the utility of telemedicine and its pragmatic constraints.

5 Results and Discussion

To draw better the TM significance, a survey has been applied between 01.02.2021–01.03.2022, for active healthcare professionals in Romania: aged 24 and above, affiliated to different various healthcare facilities - solo practice, private clinics, public and private hospitals, medical laboratories, and dental offices. Of all respondents, 89.9% were female. All age categories were present: 31-40 years (33.7%), 41-50 years (28.8%), 51-60 years (19.5%), 24-30 years (11.8%), and over 60 years (6.2%). Consultants/academics (46.9%) proved the most prevalent, specialist doctors (34.5%), residents (13.8%), and dentists (4.8%). Over 75% of respondents primarily provided in-person medical care. 90% of them declared they used modern ICT tools to improve patient communication. 90.6% of doctors relied mainly on phone communication, while 80.3% used mobile chat applications, text messages (59.6%), emails (52.4%), video calls (25.5%), or other methods (6%) (Figure 3).

With respect to TH services, 73.3% of doctors reported individual consultations and appointments as the primary mode of communication with patients; mail, couriers and messenger followed (28.6%). 8.2% used a dedicated TH platform – for patients. 3.8% of respondents preferred the groups' discussions (Figure 4).

Concerning the provision of telehealth services, a significant majority of physicians (73.3% or 305 respondents) indicated that patient communication and interaction occurred through pre-scheduled individual consultations or appointments. The use of mail, courier services, and messenger accounted for 28.6% of responses. Notably, a mere 8.2% (34 physicians) employed a dedicated platform designed for this specific purpose, namely a patient portal. Discussion groups constituted a further 3.8% of responses (see Figure 4).

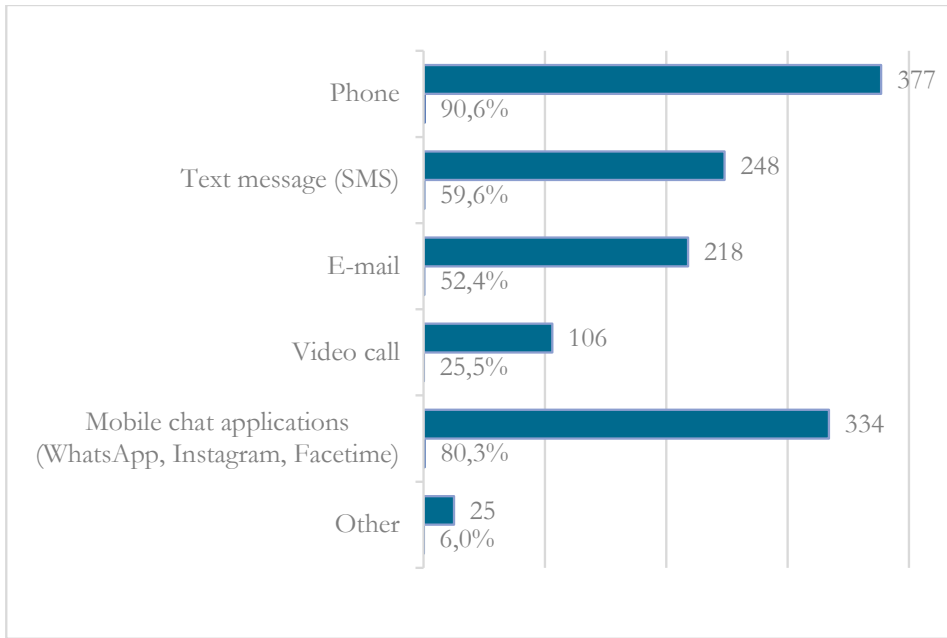


Figure 3: Distribution of electronic means of communication used in providing healthcare.

Source: Mihoreanu et al. (2022).

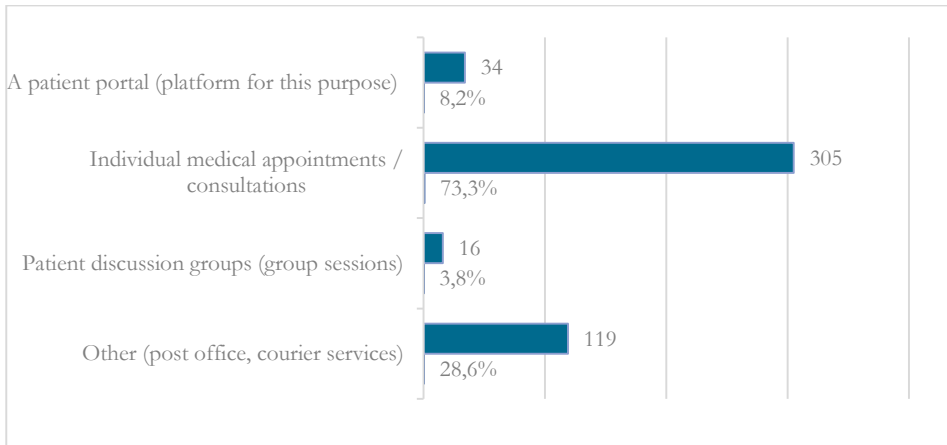


Figure 4: Distribution of electronic communication methods used for providing medical assistance.

Source: Mihoreanu et al. (2022).

The majority of research participants identified the following benefits of providing medical services via telemedicine: • direct contact with the non-displaced/ difficult to move or isolated patient at home (75.7% or 315 doctors); • medical assistance for patients from hard-to-reach geographical areas (71.4% or 297 doctors); • quick and valuable access to specialists and to all information necessary for the optimal development of the medical act and the indicated therapy (66.6% or 277 doctors); • real-time monitoring of the patient’s health evolution (63.7% or 265 physicians), as shown in Figure 5.

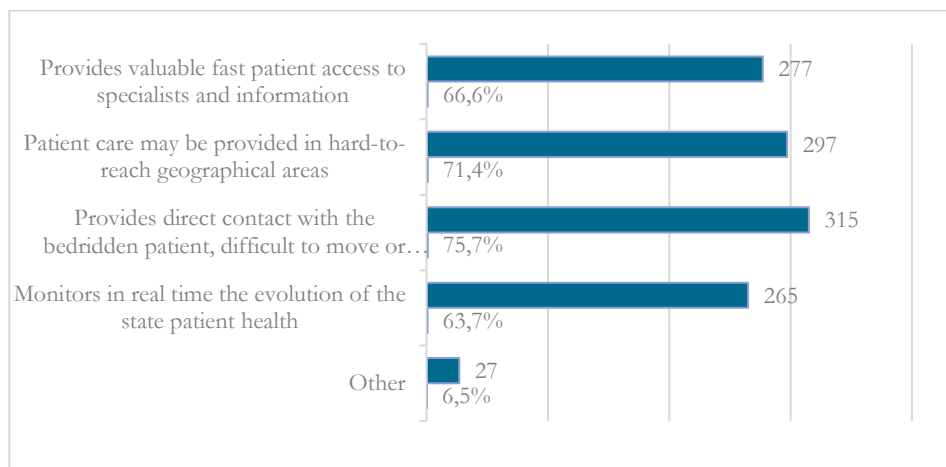


Figure 5: Benefits’ distribution of providing medical services through TM

Source: Mihoreanu et al. (2022).

The assessment of the utility of telemedicine in healthcare provision was undertaken from the perspective of physicians, who serve as the essential providers of healthcare within the system. In the realm of healthcare, medical professionals assume the responsibility of evaluating and determining the usefulness of delivering specific health services, whereas competent authorities assess the standards of healthcare quality in relation to patients' needs, rather than relying on patient self-assessment. Patients' satisfaction with received healthcare services comprises an element grounded in their assessment of non-medical factors, such as communication, information, and their relationships with medical unit staff.

The extent of the need for medical services during the pandemic and the recognition of the assistance provided by telemedicine are evidenced by data obtained from a solitary academic institution, which recorded an escalation in the number of medical services delivered from less than 100 consultations per day to over 2200 consultations per day during a monitoring duration exceeding 24 days. Telephonic and video calls were the most prevalent modalities of communication employed. Telemedicine (TM) offers several advantages, including cost-effectiveness, increased accessibility to health services for diverse categories of beneficiaries, and the potential to alleviate the persistent public health problem of health professional shortages.

6 Conclusion

TM is an essential component of a resilient reform: improves accessibility and quality, addresses new challenges for healthcare system beyond pandemic and provides benefits for all actors involved. Some challenges are still to overcome: ensure data security and privacy, provide adequate support and training to patients and staffs, driving further innovation and health improvement.

The future of digital transformation is promising with increased investment and interest in artificial intelligence and its tools. As healthcare continues to evolve, digital transformation will better define its role in integrating: the healthcare education of both patients and professionals, better access to all services, a higher quality of care and ensuring treatment continuity at all times.

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