

## **HOW TELEMEDICINE CAN SUSTAIN THE ROMANIAN TRANSFORMATIONAL REFORM**

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### **Abstract**

The healthcare sector faces the last years' crises have long-run unexpected consequences that put the light on the need to strengthen by modernization and quality increase of the medical services. The recent diseases have also challenged the working systems and the remote interaction via audio-video transmission operating systems comes as a social benefit for all actors involved. This paper analysis the role of telemedicine within the teleworking health reform, based on innovative transformational hints. The authors identified the advantages and limits of practicing the medical profession within pandemics, extrapolating the medical services practice through applicative operational structures under a legal frame validated at European level. The results of a survey are analyzed here using a research survey. The study confirms that telemedicine has high potential; its use helps improving the medical act quality through effective operational activities, relieve hospitals by rapid filtering and prioritize patients to get optimal treatments for their better satisfaction. It represents both an opportunity and a requirement in the process to give the healthcare system a hint to shape and use holistically and efficiently the organizational innovation and the administrative drive. The approach opens new horizons to research, from the beneficiary of telemedicine's perspective to e-health services' future to optimize results, improve satisfaction and strengthen excellence. The research could also facilitate the decision on how telemedicine practice and governing can play for all parties' benefit.

**Keywords:** COVID-19, eHealth, Mobile Health, Health Security, Pandemics, Public Policy, Telehealth, Telemedicine

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## **1. Introduction**

During the COVID-19 pandemic our societies witnessed the crisis of an overwhelmed healthcare system challenged by a rising number of patients, logistic non-conformities, shortage and exhaustion of medical staffs, inappropriate public management, and inefficient crisis related public policies. The current data reflecting the evolution of the pandemic and the response of several different sectors of activity provide us the opportunity to assess the management of the crisis and understand the weaknesses of our public system. While further research is expected on emergent data, this paper argues that innovative transformation should start with developing a smarter design of the public policies that would allow the formation of resilient human resources backed by technological development.

The COVID-19 pandemic surprised all operational actors of the medical and healthcare sector. The consequences proved to be dramatic. While the health system represented the first target, other branches of our societies were eventually hit by the results of the pandemic. International events have been cancelled, travelling was reduced, and a high number of industries were affected. The world economy, fragile under the health crisis, still suffers from the pandemic aftermath, and continues to be challenged by geo-strategic, political, and social events.

The health sector, overwhelmed by the avalanche of requests for health services, is constantly mobilizing and innovating in the use of existing resources, beyond the borders of the rational, to save as many lives as possible and diminish the economic losses.

The COVID-19 era has brought many challenges based on high alerts and full resources use by the health emergency while the coordination and proper functioning of all health systems has become a strategic international concern for the coverage and accelerated settlement of the demand for medical services. Such atypical crises called for abrupt change witnessed in different contexts: the pattern and times of operation, the rank of services provided, the way of delivering the medical care to cope with the pandemic and its consequences. Today, healthcare administration and patients feel wiser in handling the COVID-19 combat; however, their targets remain linked to reduce the disastrous effects and provide the population with higher quality services. The main solution provided by this paper is telemedicine (TM), arguing that it can represent part of the sustainable health reform.

## **2. Literature Review**

Evidence shows that the pandemic amplified the existing factors that plagued the healthcare system over time: inefficacy of over repetitive routine, frustration rooted in the highly bureaucratic administration, ineffective workflows that prevent the good care for patients and destroy the fulfilling relations between medical staffs and patients. Reforming the health field means transferring the burden of tedious manual work from humans to technology. In this regard, telemedicine (TM) can represent part of the solution for a sustainable health reform.

Institutionally, TM refers to the “remote exchange of medical information and/or services between patient and clinician using electronic technology, via communication of

information” [1]. The last years, TM has become more of a complementary structure in the practice of medicine than a special, separate practice of the classical one. As some authors underline [2], the health authorities' interest in TM grows and it mainly refers to the operational and technological infrastructure, safety, security, legal framework including the circumstances in which this practice can be put in use to improve accessibility and quality of healthcare on behalf of the most precious of the societal assets - highly qualified human capital, time to react, logistics and finances.

The literature mentions over 100 definitions for TM [3]; it also suggests its affiliation with contemporary sciences [4], presenting it as a dynamic development, a versatile evolution and innovative application of the smartest technology and medical practices encountering the growing demand for health services and customize the diverse context of modern societies [5]. The TM concept differs from the “telehealth”. The single provider of medical services relies in the medical doctor hands, unlike the telehealth which is served by any other categories of healthcare professionals - nurses, midwives, pharmacists. For a better understanding of things, both concepts are used in the paper.

WHO defines the concept of TM through three of its essential elements [5]: a) purpose - providing clinical support, b) mission - improving health outcomes by overcoming geographical barriers and connecting with users who are not in the same physical location, c) medical support instruments used with patients to make operational the technology of information and communication (ICT). TM uses new technologies; therefore, complements classical medicine and allows the provision of remote clinical services, in any critical situation where patients are isolated as a necessity, due to a disease, or suffer physical or geographical unavailability [6]. The pandemic challenges the society had to face, defines the precise moment of opportunity to develop and improve ICT tools in any of the healthcare activities. The TM practice will neither replace the medical clinical examination nor the medical investigation; as a fact, it can effectively help reducing the spread of infection and prevent visits from patients with non-emergencies medical conditions in overcrowded or in crisis health facilities.

Despite the successful evidence of TM practice abroad, its use in Romania has been limited [7] by methodological, financial, praxeological and regulatory obstacles:

- liability for malpractice,
- forensic issues related to reimbursement of the medical service provider,
- technological challenges,
- training the patient on the use of some devices,
- patient access to technology.

Meanwhile, the health authorities advance and facilitate the e-healthcare implementation, temporarily removing the technological or forensic barriers to expansion. The new institutional and regulatory framework provides a unique opportunity for the widespread use of TM services to meet the growing demand for medical care for patients in solitary confinement at home or away from the healthcare unit to which they are referred to.

Both in the academic circles and in business practice it has become increasingly clear that scientific and technological developments bring to the forefront the potential of using TM in healthcare, increasing the accessibility and the quality of healthcare while improving patient satisfaction. Despite the results, legislative regulations limited the use of TM in the pre-pandemic period. Thus, the legislation maintains brief references to: “defence telemedicine – through projects related to the processing of multimedia medical investigations for national defence (2020)” and “rural telemedicine” [8] through pilot projects on “Increasing the quality of medical care in rural areas by implementation of a Telemedicine Information System” approved by European Commission Decision no. 3472/12.07.2007. Over time, projects have proved inconsistent to develop and make operational the chosen fields [9].

Late 2020, the Romanian Government issued the Ordinance no. 196/2020 [10] amending the Healthcare reform Law no. 95/2006 [11, 12], to strengthen the telemedicine support framework. The Ordinance states that public and private “health units (...) have opportunities to provide medical care through telemedicine” defining it as “the sum of health services remotely provided by using all kinds of ICT means”. Moreover, TM has been also defined by the advantages supplied: a) emergency portable systems set on ambulances ensuring the real-time transmission of biometric and clinical data and the specialist indications transmitted and applied to patients by emergency paramedical staff; b) rapid and cheap access to recent data, scientific documents with the possibility of recognizing their scientific value and their innovative accuracy; c) permanent remote monitoring of patients, by optimal use of technological devices for chronic patients that can now benefit of the remote monitoring, audio-video dialogue with specialists accessing the necessary medical information of each patient, saved and preserved in a specific information system, through technological tools available to patients - telephone, tablet, computer, medical applications, specific monitoring equipment. In this sense, interactive TM proves to be the absolute operational form for the medical field, through technologies. It is based on the synchronous, real-time interaction between the patient and the physician, through audio and video technology. *Interactive TM* remains a viable alternative of the face-to-face consultations; avoid long distances, high costs and adverse weather conditions. TM is comparable to a consultation, diagnosis, prescription, and associated medical advice. TM supports permanent monitoring and an open dialog between doctors and patients any time is necessary. In specific cases, a nurse or technician may facilitate the consultation using e-health tools.

### **3. Methods**

#### **3.1. Study design and procedure**

The present methodological approach is based on a four stages investigation, modelled as follows:

- identify the current state of knowledge in relation to the medical care provided through telemedicine and the current conceptual context in the international and national practice of TM during the pandemic;
- prepare and perform a questionnaire survey of physicians in assess their perception regarding the use of TM as a way of practicing healthcare;

- analyze the collected data
- highlight the positive aspects of the TM utility and its practical limits.

The main objectives are directed to conduct an impact analysis about using new technologies as innovative sources of reform, identify the physicians' perception. as major providers of health services about practicing telemedicine and to assess usefulness and side effects of this form of practicing medicine, with a reforming purpose, to improve the quality and availability of medical care in Romania. The research hypotheses proposed for testing highlight the following:

*H1: During the pandemic, the practice of TM proved to be a useful alternative for over 75% of the doctors surveyed.*

*H2: TM provided the most services for the population with chronic diseases (diabetes, cardiovascular disease, neurological diseases) compared to other categories of patients, according to over 75% of doctors surveyed.*

*H3: Over 75% of respondents considered of urgent need the implementation of a national technological infrastructure and well-defined legal framework, for the optimal use of telemedicine for patients and society.*

### **3.2. Study participants and sampling**

Summarizing, from the total of 504 completed questionnaires, 416 questionnaires were validated fulfilling the initial conditions of the proposed study. A number of 88 completed questionnaires were excluded because they did not meet the selection criteria: 59 questionnaires were completed by doctors from outside Romania, 16 questionnaires were incomplete, and 13 questionnaires were completed by other non-medical staff rather than doctors.

### **3.3. Study instruments**

The questionnaire, consisted of 14 questions with pre-formulated answers, of which 9 were single answer questions and 5 were multiple answer questions. The questions target the perception of doctors regarding the provision of medical care through TM in Romania during the pandemic. To obtain the highest level of statistical robustness, the research was conducted by analyzing and interpreting a number of 504 questionnaires filled by doctors active in Romania during the pandemic. The respondents of the valid questionnaires, considered relevant for research, are doctors in different stages of professional development (residents, specialists, primary care physicians / consultants / academics, dentists), over 24 years of age, affiliated or working in different health facilities (individual office / private clinic / state or private hospital, medical analysis laboratory - individual / private / in a hospital, dental office).

In the current context, dominated by social distance restrictions, the questionnaire was distributed and completed electronically by the respondents. Starting from the fact that currently in Romania, are 58 specialties of general medicine and 6 specialties in the field

of dentistry legally recognized, the respondents were selected based on two criteria, namely:

- professional training
- place of activity,

in order to capture the diversity of healthcare and appreciate the relevance of physicians' perceptions for the present study. Until present, the Romanian legislation has not established the medical specialties that can be the subject of telemedicine services. That is why the doctors were not asked about the specialty practiced.

### **3.4. Data analysis**

The analysis considered exclusively the opinion of doctors who provided medical care in Romania during the SARS-CoV-2 pandemic because the activity carried out in another state could generate responses under other legislative incidences than those in our country, which could influence the results of this research. Incomplete questionnaires were excluded from the analysis. In short, the criteria for inclusion in the study refer to:

- the respondent is an active registered doctor, practicing on the Romanian territory during the SARS-CoV-2 pandemic;
- the medical unit is the doctor's affiliation / establishment where he usually carries out his activity;
- the included questionnaires were completed in full.

## **4. Results**

The respondents of the questionnaire are doctors over 24 years of age, working in Romania between March 2021 and February 2022 in different stages of professional development (residents, specialists, primary care physicians / consultants / academics, dentists) being affiliated or employed in different types of health units (individual office / private clinic / state or private hospital, medical analysis laboratory, dental office) which currently provides medical services in Romania.

The patients' majority who completed this questionnaire were women (89.9%), and the rest of 10.1% was men. The age categories best represented are 31-40 years (33.7%), 41-50 years (28.8%), 51-60 years (19.5%), 24-30 years (11.8%), over 60 years (6.2 %).

The level of professional training of doctors participating in research overlaps, in general, with the best represented age ranges. The predominance of consultants / academics (46.9%) is noticeable, followed by the specialist doctors (34.5%), residents (13.8%) or dentists (4.8%) proving that in the field of medical education, the degree of vocational training is obtained through continuous medical training and specialization over time (fig. no. 1).

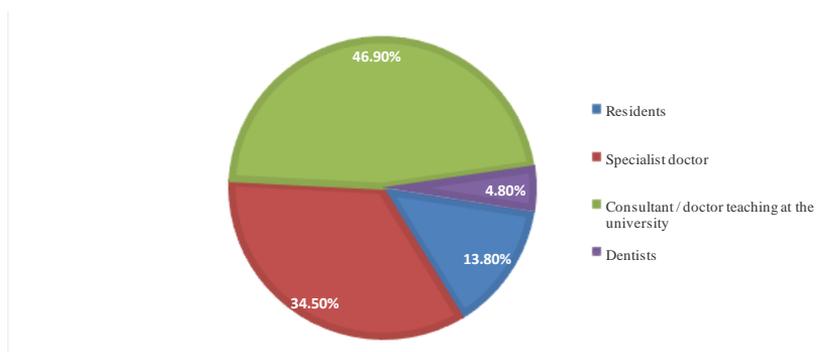


Figure 1. Respondents' distribution according to their professional training level

Regarding the place where they carry out their activity or the institution to which they are affiliated, 379 doctors (91.3%) of the respondents declared their affiliation to a health institution, individual office, private clinic, state or private hospital. Although during the research (March 2021-February 2022) most doctors (over 75% of respondents) performed their work mainly at work, practicing medicine in the classic way, face to face with the patient, however most of the respondents, over 90%, affirmed that they used modern means of communication (telephone, sums, email, video call, mobile applications) to strengthen the dialogue with patients, thus identifying what types of means of communication they helped them in clinical practice (fig. no. 2).

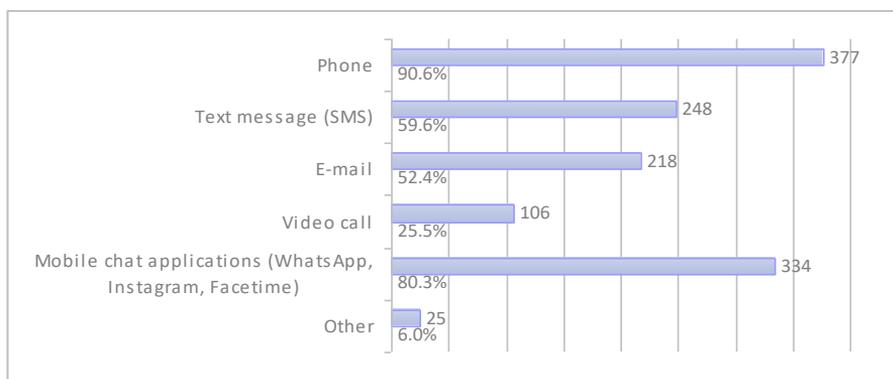


Figure 2. Distribution of electronic means of communication used in providing healthcare

Thus, 377 of the doctors (90.6%) state that they used the telephone as the main communication tool with patients to provide remote healthcare, while more than three quarters of the respondents, that is, a number of 334 doctors (80.3%) used mobile chat applications such as What'sApp, Facebook, Instagram, Facetime). Preference list continued with text messages (59.6%), emails (52.4%), video calls (25.5%) and other (6%).

Regarding the telehealth services provided, most doctors (305 respondents - 73.3%) specified that the dialogue and communication with patients took place through individual consultations / appointments previously established. The mail, couriers, messenger counted

for 28.6%. Only 34 doctors representing 8.2% used a platform created and intended for this purpose, a portal for patients. Discussion groups represented 3.8% (fig. no. 3).

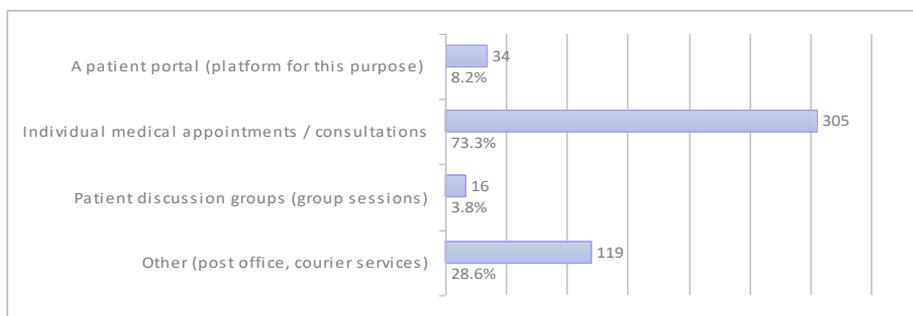


Figure 3. Distribution of electronic communication methods used for providing medical assistance

Most of the respondents participating in the research highlighted the following advantages of providing medical services through telemedicine:

- direct contact with the non-displaced / difficult to move or isolated patient at home (315 doctors - 75.7%),
- medical assistance for patients from hard-to-reach geographical areas (297 doctors - 71.4%),
- quick and valuable access to specialists and to all information necessary for the optimal development of the medical act and the indicated therapy (277 doctor - 66.6%),
- real-time monitoring of the patient's health evolution (265 doctors - 63.7%) according to figure no. 4.

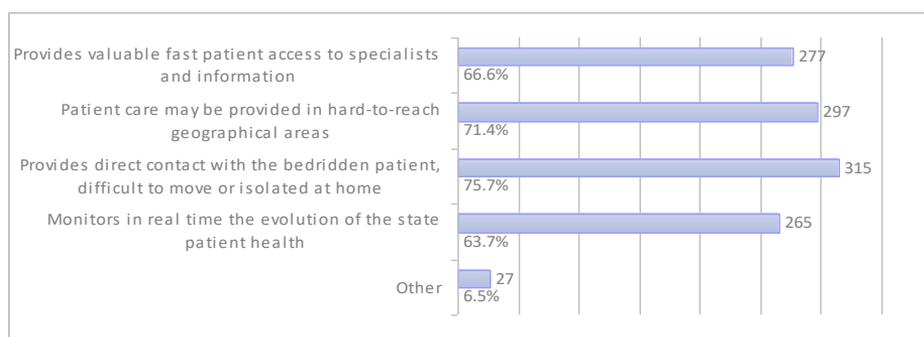


Figure 4. Benefits' distribution of providing medical services through TM

However, the provision of medical services through telemedicine has its own limitations. 374 doctors - 89.9% appreciated that the main inconvenient of teleworking in medicine was

the impossibility of diagnosing or treating certain health problems (38 doctors (57.2%) considered on the first place the lack of accessibility, 234 respondents (56.3%) faced the lack of the optimal legal framework for providing such medical care, while another 214 (51.4%) argued on the limitations and shortcomings generated by the lack of integrated technological infrastructure at national level for optimal health services . Inadequate payment was reported by 120 doctors (28.8%), and 17 respondents (4.1%) suggested other causes (fig. no. 5).

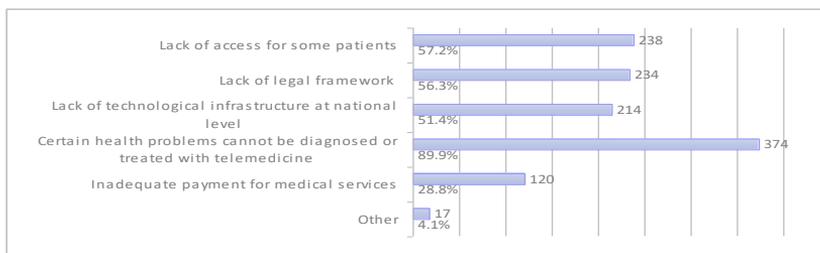


Figure 5. The limits of the distribution of the medical services used to provide TM

Respondent doctors considered that the biggest categories of patients benefitting from health services using TM were (fig. no.6):

- patients with chronic diseases (diabetes, cardiovascular diseases, neurological diseases (323 doctors - 77.6%);
- seniors with age-specific diseases (214 doctors - 51.4%);
- pediatric population (118 doctors - 28.4%);
- pregnant women (81 doctors - 19.5%);
- patients in need of medical rehabilitation (53 doctors - 12.7%).

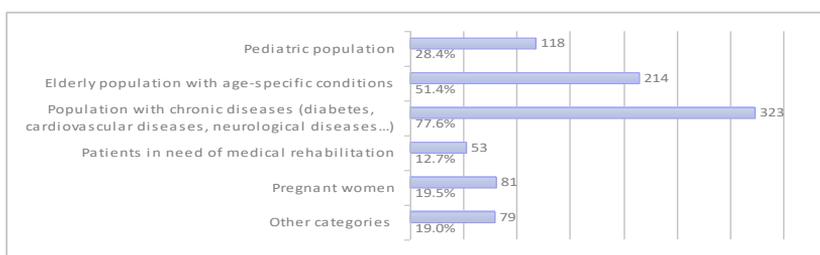


Figure 6. Distribution by categories of patients who benefited the most from TM services

The majority of respondents (322 doctors - 77.6%), considered the practice of telemedicine as a useful alternative in their specialty. Following the interpretation of the results of the questionnaire, 381 doctors (91.8%) appreciated the future implementation of a national technological infrastructure and a legal framework for providing telemedicine care not only useful, but also necessary.

## **5. Discussion**

The level of usefulness in providing healthcare through telemedicine was followed from the perspective of physicians, as the sine-qua-non providers of health services within the system. In the health field, the medical professional evaluates and decides over the usefulness of providing certain health services, while the evaluation of the standards of quality of the health services are analyzed in relation with the patients' needs by the competent authorities, not by the patients themselves. Patients' satisfaction after receiving a health service is a component based on the patients' appreciation of the non- medical services (communication, information, relations with the employees of the medical unit) [15, 16]. The correlation between the level of doctors' professional training and the age's intervals is based on the medical professional training curriculum for doctors in Romania. The magnitude of the demand for medical services during the pandemic and the awareness of the support provided by TM are exemplified by the data reported at a single academic institution where the number of medical services increased from less than 100 consultations per day to more than 2200 consultations per day in a monitoring period of over 24 days. Telephone, video calls have been the most widely used means of communication [17].

The advantages of TM include the cost-effectiveness, the ability to extend access to health services to several categories of beneficiaries and the potential of this type of healthcare to alleviate the shortage of health professionals, as a general and well-known public health problem [18].

Health experts have reported challenges linked to TM implementation already known in international practice:

- lack of education of the consumer of medical services on the efficacy and safety of telemedicine in the context of the pandemic,
- patients' preferences for direct contact with the doctor,
- lack of understanding about how to access telemedicine care and
- lack of information about TM, as an option to contact a health specialist when needed.

Barriers to physical examination, partly overcome internationally in some medical specialties [18], also appear in the present research. We emphasize that, along with the literature [19, 20], this study also reflects the value and usefulness of teleworking in medicine through TM in the management of chronic diseases and treatment of patients with such diseases, but also in the management and administration of palliative treatments for those diagnosed with neuropsychiatric disorders. The reluctance and distrust shown by a minority of doctors (34 doctors representing 8.2%) in creating a technological infrastructure at national level and implementing a legal framework for providing healthcare through telemedicine is mainly due to the nature of the medical specialty they practice. Therefore, using TM in Romania post operative monitoring can be achieved, but only after the operative procedure programmed or in emergency was performed in person in the operating theatre, because there are no valid options at present to perform surgical interventions similar to USA or UAE. The sample of doctors who completed the questionnaire included the existing specialties in Romania, in order to keep them representative for the active population during the pandemic.

Covid-19 has challenged the health system around the world and pointed out the vulnerabilities of the health infrastructure in all countries, disregarding the level of development. As the pandemic is slowly releasing the burden, we are constantly reminded that this recent virus was not the first and will not be the last to test human immunity and the system's resilience to such a great threat. In Romania, the healthcare sector is recognized being a high need for a transformational reform, at any level, not a matter of choice and disposability to sustain more crucially [21], a resilient communication and reach in time the final receptors. In this regard, considering the role of the family doctors (general practitioners), a reform has to enhance their capabilities and extend their competencies to use innovative tools, such as telemedicine. Although accused of limiting the accessibility to face-to-face doctor appointments, the reform has to rely on the use of technology and develop alternative paths to access medical screening and treatment - online and in-person-can, in fact, prove to be one of the drivers of a sustainable, just and equitable health system, better prepared to face the next crisis. Currently, although research proves the benefits of combining traditional paths with the developing technology, in the current context - telemedicine, the decision-makers in the governmental structures turn a blind eye to the data and to the medical personnel's experience and choose once again political driven routes.

## **6. Conclusions**

Societal turmoil such as pandemics require versatile and agile medical systems allowing very fast action responses, to minimize any negative impact on human, economic, financial, social, institutional, or societal, local, or global level. In the current pandemic context, TM represents a sustainable, rigorous, and profitable alternative to classical medicine, offering continuity in patients' accessibility to clinical services, in the social preventing anti-COVID-19 context (social distancing, isolation, quarantine).

The study shows that the usefulness of TM type of health care during the pandemic in Romania is a supporting pillar in the health system's effort to cope with negative effects caused by SARS-CoV-2 virus infection. The respondents of the questionnaire assessed the quality of these types of medical services according to several variables. The data analysis showed that the perception of medical service providers is positive and improved due to TM contribution.

Medicine is in a continuous transformation and adapted to modern times. The use of artificial intelligence in medicine, the planning of surgeries with computer technology, virtual reality for medical education, 3D technology in orthopedics, robotic surgery are just a few innovations that will transform and improve the way patients are cared for.

Using electronic devices and innovative ICT tools, telemedicine remains a definite possibility, a promising and effective approach to continuous care and monitoring of patients in need, in their efforts to access any kind of medical services. For this reason, the research remains open and will focus, in the near future, on the analysis of opportunities offered by artificial intelligence in finding solutions and perspectives for patient complex satisfaction, as the main beneficiary of these health services [22].

With OUG 196/2020 [10], the authorities took a concrete step forward in supporting telework in healthcare and offered to medicine an intelligent tool for remote working that

already proves its added values. However, to become an independent field in modern Romanian medicine, TM calls not only for norms and standards, recently and separately approved, but for a resilient vision embracing both the administrative and public policy aspects on the regulation, standardization, audit, and monitoring activities, namely:

- the list of medical specialties and nomenclature of medical services that can be provided by telemedicine,
- reimbursement of all medical services performed using TM,
- implementation of an electronic health card for each patient with doctor's access to the patient's electronic file,
- definition of electronic conditions and technological means of this type of medical assistance,
- evaluating the quality of the medical service offered by telemedicine and its validation,
- transmitting information in real time between different informatics systems (insurance company, pharmacy, health units, patients, medical services providers),
- securing of information,
- automatic generation based on digital certified signature of any documents required for various purposes (vaccine certificate, health passport, etc.).

This way, the remote activities, regardless of the field, will contribute to the consolidation of the societal value and the satisfaction of all the actors involved in such activities. After more than two years since the development of the general legal framework applicable to telemedicine, the methodological norms regulating the provision of remote medical services for more than 50 medical specialties are approved since September 2022. Their main target focuses on prevention. However, through the telemedicine service, two or more medical specialists can remotely form multi-disciplinary teams to analyze, interpret and diagnose patients with rare diseases or cases of chronic disease. This way, the legislative bases can favor new investments in TM platforms and increase the access to medical services. Several European studies like found already that telemedicine is appreciated as cost-effective in 73.3% of the cases addressed by the specialized literature: by reducing the costs of consultations, travel or time and increases the quality of life of patients.

TM and innovation can now better contribute to improving the human experience in healthcare - through efficient workflows and outstanding clinical expertise. Plenty of studies consistently show that a lack of workflow integration remains one of the main barriers to the adoption of more innovation in healthcare. They sustain the need for a human-centered system based on a fair relations' architecture. By putting people's needs in the foreground, TM can become even more useful to patients, health staffs and other economic operators, especially in situations of crisis, stress or strong pressure. We also need to keep in mind that the healthcare achievements can't exist without a healthy lifestyle and active education in the field.

Thanks to new preventive therapies, life expectancy can increase, and digital equipment can become essential in monitoring the patients' health by continuously transmitting data to doctors. If correctly used, TM has a significant potential firstly to cover those areas missing medical specialists, improve the quality and availability of medical care in Romania and reduce the pressure from the classic medical activity, carried out in health facilities lacking the necessary logistic, by multi-criteria selection of patients benefiting the most from this type of medical care. The disproportion between the advantages provided by scientific research and the clinical reality, illustrated especially in times of crisis or pandemic should never be forgotten or accepted.

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