Digitalization of Medical Services -
A New Ally for Malpractice Risk Management

Larisa (Grigorie) Pătru
Institute of National Economy, Romanian Academy, Romania
grigorie_larisa@yahoo.com
Corina Aurora Barbu
"Ovidius" University of Constanta, Romania
coribarbu@yahoo.com
Ciprian Laurențiu Pătru
University of Medicine and Pharmacy from Craiova,
Department 8 Mother and Chid, Romania
patru_ciprian@yahoo.com

Abstract

This paper examines the concept of digitalization of medical services as well as the role it plays in managing the risk of malpractice. Starting from the applications of technology in the medical field, this paper aims to analyze the possible effects and implications on the professional error committed in the exercise of the medical act that created damages.

The article addresses a niche topic, in an area of strict specialty and interest. The authors debate aspects of the activity of providing medical assistance and the associated risk of malpractice in the context generated by new technologies. The research methodology used is mainly based on the review and synthesis of the existing literature.The conclusions are intended to be an invitation to academic dialogue and a starting point for researchers and practitioners.

Key words: digitalization, medical services, medical malpractice, risk management, new technologies
J.E.L. classification: O33, I15, K42

1. Introduction

The conviction that digitalization will inevitably be present in any practice of providing medical assistance emerges from the policies of international bodies, the reports of specialty bodies, but also from the promising support of the academic environment and workers in the health sector. Globally, there is a consensus that digital solutions in healthcare can considerably improve the services in this field and give people the chance to live longer and free from diseases.

The digitalization of medical services is a process of transforming traditional medical services into technology-based ones, by using digital solutions and electronic devices to manage and improve the provision of the medical act. Lupton, 2017 highlights the benefits of digitizing medical services and concludes that digital data is the foundation of the process of rethinking and reorganizing a medical system. Also, the author shows that the use of technology is a potential factor in changing the behavior patterns of patients in terms of their health. Carboni et al., 2022 conceptualizes the process of digitalization of work in the healthcare field, focusing on the study of the directions of innovation and technological progress, but also on the changes taking place in the working climate. It can be said that he introduction of technology in the medical act generates systemic changes.

As the problem of the occurrence of professional errors in the exercise of the medical act has been constant, there is an interest to see if the use and development of technology in the medical field can generate mutations and evolution.

Concerns about reducing or even eliminating the risk of making a medical error come from the precision and infallibility of clinical decision support tools based, for example, on artificial intelligence.

2. Literature review

The academic literature on the digitalization of medical services has predominantly focused on the presentation of new medical protocols in the case of the use of technology. Thus, we are witnessing a growing enrichment of the literature with case presentations and medical experiments, with the digitalization process as a common denominator (Rakhmatullov et. all, 2022; Estel et al. 2022, Richter et al, 2023).According to Stoumpos et al, 2023, there is an upward trend of academic works in this field, especially in the last 8 years. The study carried ou highlights the importance of this field and its accelerated development.

2.1. The risk of malpraxis and medical errors

Results of studies in America showed that medical errors were responsible for thousands of deaths annually and ranked third in the list of causes of death. Worryingly is the fact that less than 10% of all medical errors were officially reported. (Aljabari and Kadhim,2021.). Waeschle et al., 2015 addresse the individual causes that lead to the making of medical errors and identifie "confirmation bias, fixation error and prospective memory failure" (p.689). These may be the result of stress , distorted information, complexity of the system or insufficient professional experience. The occurrence of a medical error is a primary cause of medical malpractice.

In practice, medical malpractice is perceived as the failure of a doctor to follow standard procedures. The digital transformation of health causes the application and compliance of the medical standard to become a challenge for the medical staff. (Rowland et al., 2022)

Allegations regarding the existence of an alleged case of malpractice are a concern for medical personnel. (Institute of Medicine (US) Committee on Quality of Health Care in America, 2000.) They attract litigation that involves stress as well as physical and emotional exhaustion.(Tsai et al., 2023; Ryll, 2015). Despite the negative effects that the appearance of such a case produces, of a personal and professional nature, on medical practitioners, the issue of malpractice is still a taboo and a topic that few debate. (Arimany-Manso et al., 2018). Even so, the risk of a malpractice case must be addressed as an inherent part of the process of performing a medical act.

The analysis and resolution of a case of malpractice is a difficult process from the perspective of the complexity and values that the elements involved can have.

Without pretending to exhaust the subject, we list some of the questions that medical practitioners involved in a malpractice case must ask themselves:

-What is the definition of the medical act involving technology and what are, concretely, the medical procedures assimilated to the medical act?

- What are the professional obligations of the medical practitioners?

- What is the accepted medical standard for a certain medical procedure involving technology and what conduct should doctors approach in the context of the coexistence of different standards?

- Do doctors have professional independence? Who decides when the doctor and medical devices (especially those that use artificial intelligence) have different ways of solving the medical case?

In the context of the rapid growth of medical information, access to electronic medical records, the use of artificial intelligence and medTech mechanisms, the existence of a positive impact on the risk of medical errors is sought.

2.2. Electronic medical records (EMRs)

We are currently witnessing a transition of all entities from the health field to the successful implementation of electronic technology, in all clinical specializations, with the aim of easy access and exchange of health information.(Honavar, 2020).

The main goal of using the EMR is to increase accuracy and systematize information in support of medical decision-making and the accessibility of information regardless of space and time. As Holroyd-Leduc et al., 2011 points out, computerized entry of medical indications reduces prescription errors. A thorough documentation of clinical decisions (correctness of the data entered by the clinician but also access to the metadata) leads to an increase in the ability of doctors to defend themselves against malpractice claims, but only when the medical act complies with the standard of care accepted by the official clinical guidelines.(Paterick et al., 2018)

In fact, the electronic medical records can be perceived by the healthcare workers as a tool that, through the advantages it offers, can considerably reduce the risk of medical errors and implicitly malpractice accusations. (Maliha et al., 2021)

2.3. Artificial intelligence (AI) and machine learning (ML)

Medical technology that uses artificial intelligence or machine learning algorithms is characterized by an incredible accuracy and precision. These characteristics conferred it the status of "*an expert* "in the medical field. The indisputable benefits of artificial intelligence and machine learning algorithms made them be accepted and used on a global scale in a very short period of time. (Basu et al., 2020) .Predictions are that "healthcare professionals will use AI to enhance the care they provide, enabling them to provide safer, more standardized and more efficient care at the top of their license." (Bajwa et al., 2021, p 193), As a result of the performances that surpass the human mind, it is expected that in the future artificial intelligence capable of diagnosis and treatment will be successfully adopted in the medical system. (Banja et al., 2022)

The study carried out by Zuccotti et al., 2014 demonstrate that the support for clinical decisions (technological applications) can prevent the occurrence of malpractice cases. The authors show the benefits brought to the medical act by consenting in increasing quality and safety, as well as the role of reducing the occurrence of malpractice payments.

Regarding the liability for medical errors in the case of the use of AI, Geistfeld et al., 2023 identifies three possible scenarios: " AI personhood, common enterprise liability, and a new standard of care" (p. 28). The authors shows that in the first two scenarios, the responsibility for the occurrence of a case of malpractice falls, mainly, on the medical technology developers. In case of the emergence of a new standard of medical care, doctors as users of technology can be responsible for medical errors only in certain situations.

The technological particularities consisting in the unique capabilities and functions of AI and artificial vision, combined with the progress made in the interpretation of medical results are a premise for minimizing the doctor's liability. The improvement of AI and Alg and their global use could cause their use to become the new standard of care, as happened, for example, with MRI or CT.

We emphasize that the obligation of doctors to apply the standard of official care has a mandatory and autonomous character and remains regardless of the result of the AI/MLS algorithm. (Maliha et al., 2021). We notice that in the specialized literature there are authors (Price II 2018, Perakslis, 2021) adepts of the transition towards the emergence of new medical standards that incorporate technology and the use of artificial intelligence.

At the opposite pole, there is academic research that analyze the negative effects of the introduction of digitalization in the process of making a medical decision. In this sense, a reference work is the article written by Rowland et al., 2022 that presents the main risks associated with modern medicine and the vulnerability of medical practitionaires to the occurrence of cases of malpractice in the context of the use of technology.

3. Research methodology

The aim of the present study is to examines the concept of digitalization of medical services as well as the role it plays in managing the risk of malpractice. For this purpose, we performed a systematic bibliographic review, using Science Direct, a database covering interdisciplinary research fields, from 2018 to 2024.

The methodology is based on the directions given by Jane Wester and Richard Watson (2002). To build our search string, we simultaneously entered the following keywords relevant to the topic in the database: digitalization, medical and malpractice. The search was conducted in June 2024 and identified 726 papers, of which 268 met the inclusion criteria for further processing. In the next stage, we eliminated and added studies considered relevant, summarizing a number of 126 articles grouped into two themes: A - conceptual approaches and the impact of digitalization of medical services and B - the risk of medical malpractice associated with digitalization of medical services. The belonging to one of the two categories of an article was done according to the content and the main concepts analyzed within them.

4. Findings

In the following rows, we present the findings of the research in the form of tree eloquent figures.
By analysing the figure above, it can be noticed that there are various spheres of interest for researchers regarding the components of the digitalization of medical services. By entering into the database the combination of the first two keywords – digitalization and medical will result any of the topics identified in the Bibliometric map of the digital transformation and healthcare.
According to the Figure no. 1, the main topics of academic debate are e-health, health care, telemedicine, telehealth and mhealth. We note that legal and malpractice issues are insufficiently addressed in the literature to be marked on the map.

Figure no. 1 Bibliometric map of the digital transformation and healthcare
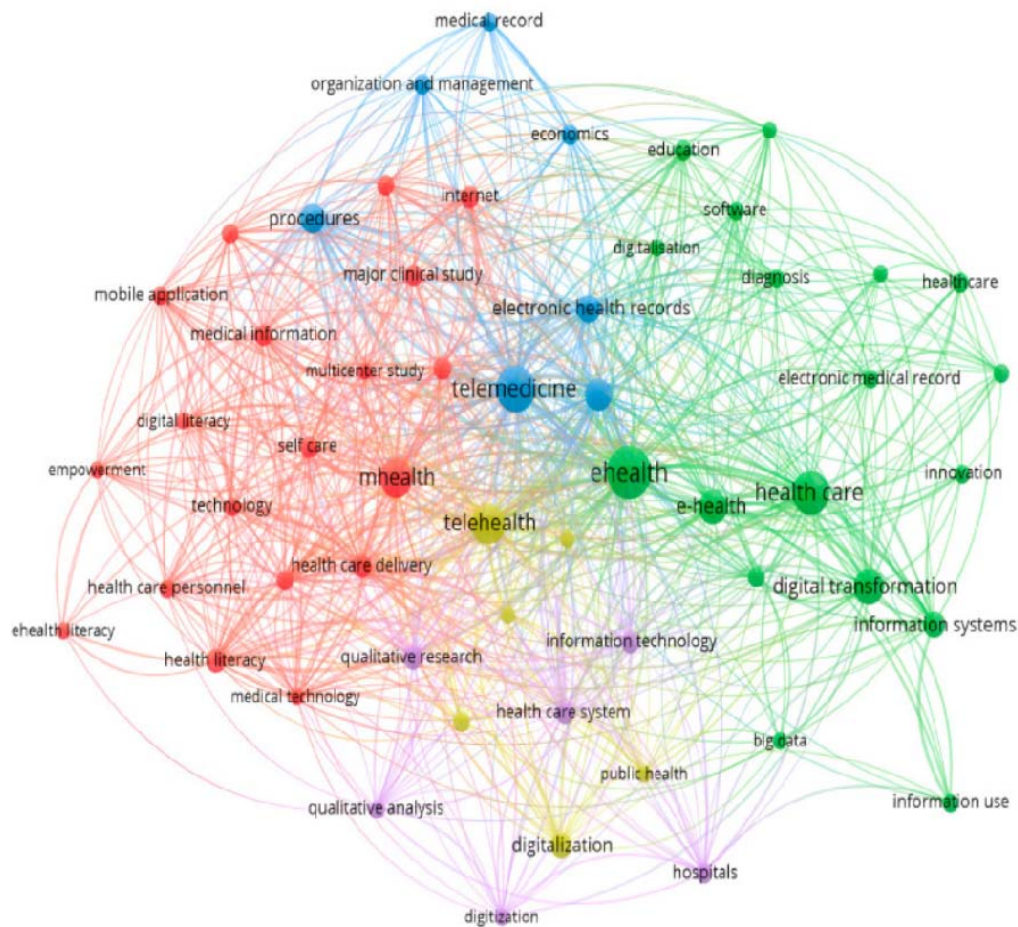

Source: (Stoumpos et al., 2023, p. 9)

Figure no. 2 Summary of applications of digital health technologies
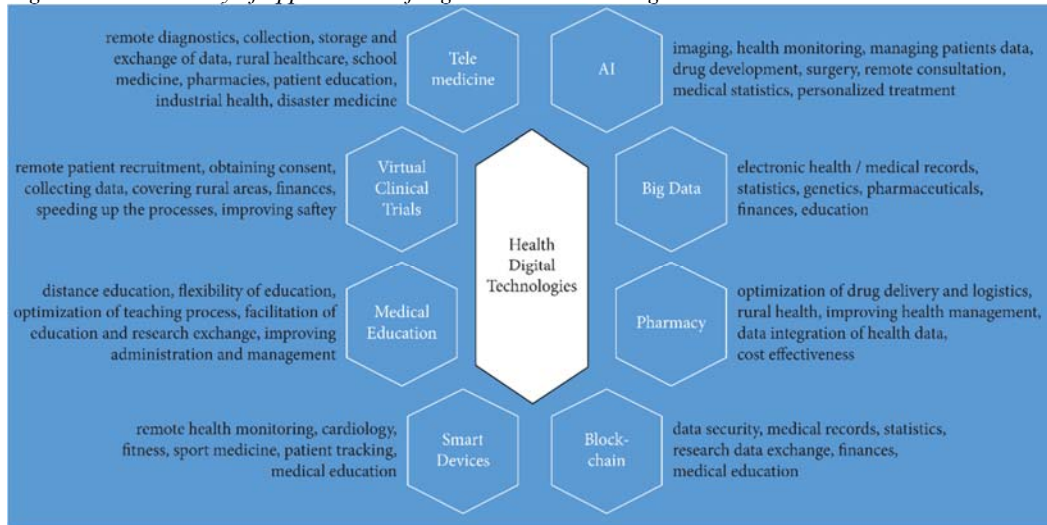
Source: (Senbekov et al., 2020, p. 12)

Figure no. 2 shows the most important applications of technology in the medical field and the main areas in which they can be used. We note that issues of patient safety and access to medical data are highlighted. However, there are no references to malpractice risk management or limiting medical errors in general.

Figure no. 3 Consequences of digitalization of medical services on the risk of malpractice
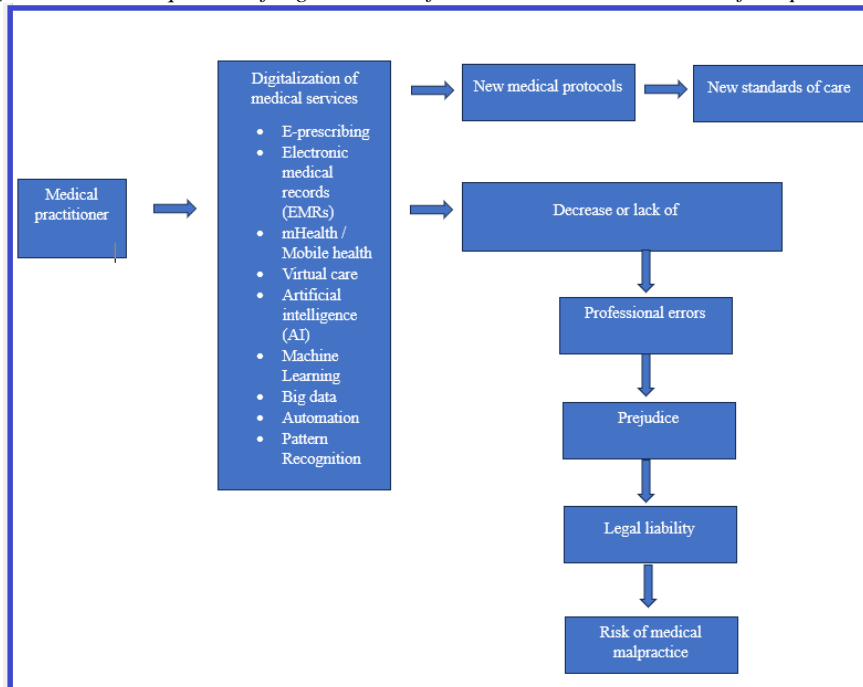
Source: designed by the authors

Based on the above, we believe that digitalization of medical services can be a real ally for medical practitioners in limiting or even eliminating medical errors. The transformation of medicine by absorbing technology in the provision of medical care has the characteristics of a safer medicine for both the patients and the medical practitioners. The applications of technology in the medical world have proven characteristics that will lead to new protocols and subsequently new globally accepted standards of care. Also, the accuracy and precision of the technology integrated into the healthcare

system promises to reduce or eliminate medical errors. We emphasise once again, the role of healthcare professionals to critically analyse and evaluate any medical solution contrary to the one they would traditionally apply. Any avoidable prejudice to patients also means avoiding medical malpractice.

5. Conclusions

The article indicates that the introduction of technology in the medical world generates changes regarding the occurrence of medical errors but also the liability. The existing specialized literature is limited and the analysis of the main works shows the need for additional research. This article focuses on the issue of the emergence of malpractice cases as a constant concern of health practitioners in the context of the benefits brought by the introduction of technology in medical practice.

In order to understand how medical errors can be limited or even eradicated, the digitalization process must be implemented with caution, after a thorough and updated study by the medical practitioners. The present study added a new contribution to the existing literature on digitalization and medical services and opens the academic appetite for new issues: who is responsible when the medical solutions indicated by technology are incorrect? with the introduction of digitalization, does a new typology of characteristic medical errors appear? is there a need for new skills for the medical practitioners so that technological progress can be implemented in the medical act?

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