

ETHICAL CHALLENGES IN MEDICAL SERVICES

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Abstract: *We live in an era that offers more and more different healthcare alternatives: innovative technologies, high-standard medical interventions, state-of-the-art treatments, all to give people the greatest possible life expectancy. In order to put medical ethics into practice, it is important both to recognize the problems involving ethical norms and principles and to resolve them. The structural and practical challenges of medical ethics lie in policy making and ethical management planning activities.*

Our work proposes to answer the issue of the importance of ethics in the medical sector in the age of new technologies. The research methodology used consists in the study and analysis of specialized literature with a scientific and transparent approach, identifying existing and relevant research of recent date, regarding ethics and ethical challenges in the Romanian medical sector, the security of medical services and the implications regarding the use of artificial intelligence. The preliminary conclusions indicate the need to improve the quality management system in the medical sector, which should be oriented towards the application of ethical principles and norms, especially in the context of the use of new information technologies.

Keywords: *ethics, ethical issues, medical security, artificial intelligence.*

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INTRODUCTION

Cognitive and educational challenges in medical ethics can influence the uptake of educational programs aimed at improving the qualitative and quantitative aspects of medical ethics education for health professionals, from students to practitioners.

Patients and their families are concerned about the many challenges faced by the healthcare system, including medical errors, long wait times for diagnostic and treatment services, terminal complications and illnesses for terminally ill patients, and ethical challenges in decision-making in healthcare institutions [1].

Medical ethics is the branch responsible for the principles and values that should govern medical practices. These principles are based on respect for human dignity, patient autonomy, ethics, based on sound principles, do good, do no harm, autonomy and justice, guide health professionals in their mission to treat, care and cure.

Improving the quality of health care services in response to the growing health needs of patients depends on how attentive medical professionals are to ethical principles (Çinar and Eren, 2013) and openness to new technologies [2]. The lack of these could undermine patient's confidence and trust in the community of medical professionals.

Our paper aims to identify and analyze some studies on ethics education, ethical issues in the medical sector, security of medical services, including the ethics of artificial intelligence.

The research methodology is empirical and analytical, based on studies and articles that will answer the research question: what are the ethical aspects generated by the education for ethics and the use of artificial intelligence in the provision of medical services?

The paper is structured as follows: introduction, analysis of specialized literature, research methodology, results and discussions, research conclusions.

The paper addresses issues related to the concepts of ethics, ethics education, ethical issues, continuing with an analysis of the role and importance of ethics in the provision of medical services, taking into account both the medical data on patients and the medical records made with the help of new technologies. The issue of artificial intelligence is another point of analysis based on studies and research from the specialized literature.

LITERATURE REVIEW

Education for ethics. Ethical issues.

According to the Explanatory Dictionary of the Romanian Language (DEX, 2016 edition), ethics is the science that deals with the theoretical study of human values and condition from the perspective of moral principles.

Ethics education is essential to the training of doctors and health professionals. Educational disciplines in the faculty and the code of ethics in medical institutions play an important role in preparing doctors to understand and apply ethical principles in their daily work. Medical ethics constantly highlights that medicine is not only a science, but even an obligation towards society.

Considering that the purpose of medical services is to help and heal the sick, doctors can put their knowledge, skills, and dedication at their disposal, not only in the interest of the health of the individual, but also in terms of society, having the moral obligation to follow one's conscience and faith. A conscious attitude towards these assumed duties which arise from the essential conditions of human life constitutes medical ethics.

Ensuring the effectiveness of medical care is based on the ethical principles of the principle of doing good and helps doctors make the right decisions that protect the health and quality of life of their patients. The protection of patients' rights is based on the ethical principles of autonomy and justice that patients can make decisions about their health care and have access to the care they need. Patients' confidence will increase if they can be sure that doctors act responsibly and ethically.

Ethical problems in daily medical practice arise for various reasons and represent a threat to ethical values. If these threats are not managed properly, both patients and employees in the medical sector risk moral and material damage.

When does an ethical problem arise in the medical sector? Usually when one has to recognize what is good or bad, when one has to choose between several options that can have very serious implications for patients. Even the decision to do something or not to do something is an ethical dilemma, the basic principle of ethics in medicine today being the respect for the autonomy of the patient. At least four main ethical principles have been defined in the literature: beneficence (doing good), non-maleficence (doing no harm), autonomy and justice (Varkey, 2021) [3]. Informed consent, truth-telling and confidentiality stem from the principle of autonomy.

Medical ethics is implemented by both the doctor and the patient. Controversies and ethical conflicts arise in the practice of medicine, especially in the decision-making

process. Rarely, these conflicts arise in joint decision-making, because such conflicts arise when doctors' and patients' decisions go against medical ethical principles (Astărăstoiaie, 2021) [4].

According to the codes of ethics (eg. Code of ethics of Sf. Spiridon Hospital in Iasi, Romania, Code of ethics and professional deontology of the Timișoara Municipal Emergency Clinical Hospital, The Code of Medical Ethics of the American Medical Association) from various healthcare organizations, it is simpler to categorize ethical issues according to the problems that may arise, looking at:

- **actions:**
 - to do good/to act properly;
 - to do no harm/ to harm no one.
- **the patient:**
 - autonomy;
 - the fundamental principle of informed consent;
 - data confidentiality;
 - the right to refuse treatment;
 - the right to medical information;
 - confidentiality.
- **the professionals:**
 - defense of the dignity of the profession;
 - recognition of the responsibility and trust conferred by society;
 - collaboration in the interest of the patient with all actors involved;
 - providing services at the highest quality standards possible, based on a high level of skills, practical skills and professional performance without any discrimination;
 - avoiding all that is incompatible with individual and professional dignity and morality;
 - respecting the patient's dignity;
 - respecting the confidentiality of information and private life;
 - respecting the right to medical treatment and care;
 - the obligations to the patient;
 - protection of patients' rights;
 - compliance with professional obligations.

Another question is whether the employees of the health sector are prepared to fulfill their ethical obligation and how can their ethical skills be improved? This is where ethical education comes in.

Learning and developing ethical skills is important in healthcare professionals, starting from student years. In medical practice, ethical issues appear as ethical challenges, conflicts or dilemmas that influence the medical act (Zafar, 2015) [5]. Recognizing and solving ethical problems is about protocols, about doing what is right and in the patient's interest, about decisions, about actions and last but not least about behavior.

In the researched studies, ethics education refers to the educational elements that include learning activities that promote the recognition, understanding, and resolution of ethical issues, emphasis on ethics training found in both universities and medical institutions. Ethical issues and value conflicts are inherent in medical practice, but this does not necessarily mean that medical staff or students have done something inappropriate or that the

structures are inadequate. Regardless of the cause, ethical issues can lead to conflicts between principles, values, and behaviors (Beauchamp and Childress, 2019), which involve discrediting moral integrity and can generate moral distress (Torabi *et al.*, 2018) [6]-[7].

Solving ethical issues involves several factors. First of all, the legal one along with the correct identification of medical problems, treatment options and the clear objectives of care by professionals. They must consider the patient's preferences regarding treatment options and care goals, which are influenced by family, religious, cultural or even economic factors.

The quality of care and treatment depends not only on knowledge and skills or adherence to protocols; they depend on personal moral values, beliefs and ethical knowledge (Trobec and Starcic, 2015) [8]. Ethics education is one such way to develop ethical competences (Poikkeus *et al.*, 2014) [9]. Ethics training often raises questions about the content and, especially, the methods relevant to medical practice. Numminen proposes as an alternative to theoretical courses and seminars in ethics, a teaching/learning process based on simulation. (Numminen *et al.*, 2011) [10].

The teaching/learning process involves challenges for evaluating ethics education. Theoretical education in ethics is not exactly a realistic context or situation, and theoretical knowledge of ethics does not necessarily lead to good application of ethics (Godbold and Lees, 2013) [11].

In current university programs we find ethical principles presented and the recommendation to know ethical codes. These must be combined to avoid the risk of health professionals and students adapting to ethical practice without passing through the filter of their own beliefs. Thus, ethical competence risks being hindered by a limited attitude and a sharp moral reasoning on the situation as a whole (Mpeli, 2018) [12]. Learning ethical skills can help professionals and students orient their attention to ethical issues of which they were previously unaware, sometimes involving unfamiliar attitudes, approaches or emotions or different reactions to everyday ethical issues in healthcare. This study of ethical skills focuses on difficult and realistic situations such as: conflicts regarding informed consent or tensions between the patient's wishes and needs. All of these are related to professional norms, when honesty and respect for the patient are not present, or when there is a lack of trust in care services (Sherer *et al.*, 2017) [13].

Employees and students are constantly faced with ethical issues regarding patients, physicians, colleagues, and the organization of the workplace.

Dealing with such problems means first and foremost thinking about what is right and good to decide what to do in a given situation, doing what is right in the patient's interest which may lead to conflict with the interest of others patients and may not be ethically or legally permissible, thus jeopardizing the approach and resolution of the problem. Doing the right thing based on the patient's best interest can sometimes jeopardize the management of ethical issues, as they may conflict with the interests of other patients, or may not be ethically or legally correct.

If there is a conflict between what is perceived to be best for the patient and their right to autonomy, ethical dilemmas can arise that present two orientations: legal and ethical (Schonfeld *et al.*, 2015) [14]. Most of the time, there is at least one way to solve a situation, which makes handling the ethical issues that arise create a feeling of inadequacy or discomfort in making perfect decisions (Lin *et al.*, 2013) [15]. Therefore, ethics training should be designed to include both medical and ethical reasoning in all situations (Torabzadeh, Homayuni and Moattari, 2016) [16].

The reviewed articles identified the need for support to enable the learning of ethical skills, which in the long term was considered to promote the ability to manage ethical issues. Learning ethical skills has been shown to be useful to health professionals and students in drawing attention to ethical issues of which they were previously unaware. When professionals deal with ethical issues, they think first of all about the protocol that aims at what is right and in the patient's interest, along with making decisions about what to do in a given situation. To support learning, education is also meant to provide the opportunity to receive the necessary instruction and create added value from the information received, to shape one's moral values and social attitudes, and to assume the consequences of one's actions. Collaboration with professionals is important because it can be a valuable source of knowledge, especially for students, in having the conviction that something is right. At the same time, ethics education is influenced by experienced professionals but also by students' personal expectations and strategies. (Andersson et al., 2022) [17].

Cited studies indicate that those with less experience in the hospital are more sensitive to ethical issues than their colleagues with more experience, possibly counteracting potential inexperience (Ulrich *et al.*, 2010) [18].

Medical ethics remains the compass that guides professionals in these complex situations. (Collier *et al.*, 2012) [19].

From the participants' point of view, a major challenge in medical ethics is the gap between theory and practice regarding ethical issues (BMA, 2012) [20]. Professionals, although they have knowledge of ethics, do not present ethical practice, do not have the right attitude towards human dignity, do not involve patients in their related decisions and do not respect patients' autonomy.

The regress of moral practices is an important factor, empathy being an element that seems to disappear with the advancement in the career. Medical students have high moral aspirations upon entering medical school, dreaming of being successful doctors with ethical and moral principles until they are old. But as time goes by, they notice inappropriate things, receive rather negative feedback and change their ways and mindsets to think only of their own benefit.

Another issue nowadays regarding medical ethics could be some structural flaws that automatically lead to ethical challenges in the practice of professionals, for example, financial problems of doctors, lack of new technologies, lack of access to innovative technologies (Mashayekhi *et al.*, 2021) [21].

Many of the actors involved in public health services believe that medical ethics has not been "widespread" enough in the health system, it has not yet been fully introduced in the community, and it seems that it has not been sufficiently publicized.

Medical ethics issues are similar to computerization issues, for example, so digitalization and ethical aspects should be understood the same.

Information about the patient's medical condition is considered private. Violating a patient's privacy can harm the patient and have legal and ethical consequences for healthcare workers. Laws also determine who can see the information and who cannot, especially through the use of new technologies, the entry of digitization even in this public sector.

There are also the ethical issues related to the use of artificial intelligence in promoting medical services. They appeal to data confidentiality, patient surveillance, subjectivity and sometimes discrimination in the medical act. Wherever there is technology, there is always the risk of inaccuracy and data breaches, and healthcare errors can have devastating consequences for patients. This is an important topic to consider as

there are no clearly defined regulations regarding the legal and ethical aspects of AI and its role in healthcare.

Artificial intelligence has the ability to transform healthcare systems by providing new and important insights from the vast amounts of digital data that can be accessed much faster and more efficiently than humans.

Medical Ethics and Artificial Intelligence

Advances in artificial intelligence (AI) in healthcare are advancing rapidly, and there is a growing debate about how to guide its development. Many AI technologies will eventually be owned and controlled by private companies. The nature of AI implementations means that these companies, clinics and public agencies can play a bigger role than usual in obtaining, using and protecting patient health information. This raises privacy issues related to implementation and data security.

Many technological breakthroughs in the field of AI are made in academic research projects, subject to ethical principles.

The European Commission has proposed legislation containing compliant rules on artificial intelligence, delineating a principle of organizational responsibility for privacy and data. This fact is similar to that found in the European General Data Protection Regulation (European Commission legislative acts, 2021) [22].

AI has several unique characteristics compared to traditional health technologies. In particular, they may be prone to certain types of errors and sometimes not easily supervised by human healthcare professionals, and thus ethical issues may arise in how health information is used and handled and with personal character, if there are no adequate protective measures. Google, Microsoft, IBM, Apple, and other companies are “in their own way preparing bids on the future of health and various aspects of the global healthcare industry” (Powles *et al.*, 2017) [24]. Information sharing agreements can be used to give medical facilities access to patient health information.

To make medical AI trustworthy at the ethical level, the orientation to the ethical value of promoting human health should be considered first and foremost as a top-level concept of utmost importance. Legally, current medical AI has no moral status and the human side remains the bearer of duty. At the regulatory level, it is proposed to strengthen the management of data quality and security, improve its transparency and regulate and review the entire process of AI for risk control. Also, the social impact that its development could have must also be targeted.

The use of artificial intelligence in medical care has brought technological advances, especially in diagnostics and traditional treatment, at the same time coming with challenges and risks, both ethical and security. These negative effects are also considered ethical issues and need to be addressed through identification, prediction and monitoring as they influence trust in medical AI (Zhang *et al.*, 2023) [25].

This is an exciting time for the development and implementation of AI in healthcare, and the patients whose data is being used by these AIs should benefit greatly, if not significantly, from the health improvements these technologies produce. However, implementing commercial AI in healthcare faces serious privacy challenges. Given that personal health information is some of the most private and legally protected, there is great concern about how AI will change its access, control and use by business entities over time (Murdoch, 2023) [26].

The main factors that affect the trust of medical AI include: safety, technical reliability, usability. Data security includes its retrieval, processing and storage, involving issues such as informed consent, data quality and confidentiality.

Technical reliability, through the involved technicians, should strengthen ethical self-discipline and imprint an orientation towards ethical value in the research and development process.

Safe use targets both patients, but especially professionals, in the way it respects fundamental human rights and conforms to universal human values. One of the key values is the knowledge of ethics and especially its application. Legally, current medical AI has no moral status and humans are still responsible.

METHODOLOGY

The analysis of the specialized literature provides valuable information about the issues of medical ethics, being essential to substantiate our research. A literature review is a comprehensive analysis of the available literature, in this case medical academic publications relevant to the topic and to the research question on ethical issues arising from the education for ethics to the use of artificial intelligence in the provision of medical services. All studies deal with different ethical issues related to data security, autonomy, and accountability.

The identified studies are from different areas of the world, namely Europe, the USA, Asia, and the Middle East, having as common points ethical issues and reflect the concern of the last years, starting from 2019 and until 2023, for this topic and the attempt to involve both professionals, patients as well as those responsible for the implementation and construction of AI.

Empirical studies on ethical issues

For sustaining the theoretical approach, the following studies were analyzed for exploring the main ethical issues concerning the use of AI in healthcare systems.

a. Tenzin Wangmo, Mirjam Lipps, Reto W. Kressig and Marcello Ienca in the study "Ethical concerns with the use of intelligent assistive technology: findings from a qualitative study with professional stakeholders" from 2019, assessed the ethical issues that the professional stakeholders in Switzerland, Germany and Italy perceive them in the development and use of AI in the care of the elderly with dementia.

As a method, they conducted a multi-site study involving semi-structured qualitative interviews with health researchers and employees. They used descriptive thematic analysis to explore relevant ethical challenges inductively. Interviews of 20 researchers and health care professionals on ethical concerns related to the use of intelligent assistive technology highlighted ethical issues related to autonomy, accessibility, human interaction, and privacy.

By exploring the views and needs of both patients and stakeholders, we can ensure that technology and healthcare development is seen as a useful way of prospectively assessing practical, technical, clinical and ethical challenges. They emphasized the importance of ensuring the focus of specialists when designing AI, end user acceptance. Stakeholders recognize the AI technologies available and their applicability, but cite existing obstacles that prevent widespread adoption by end users. Impediments to implementation include the relatively high cost and lack of knowledge about using these technologies to improve health outcomes. Participants discussed informed consent and deception, all through the filter of the principle of autonomy.

Accessibility is discussed as an equal access concern, with data access and data sharing discussed in terms of privacy and autonomy principles. Most of the participants discussed the issue of data management, collection and storage, regarding ensuring protection when using AI, proposing the transmission of this information to third party services. Thus, two aspects were significant within this theme: access to data and data sharing that call into question the privacy and autonomy rights of people with dementia.

A relevant ethical issue has been the idea that AI, at least in its current state of technological innovation and readiness for the medical market, should complement human care, not replace it. Since it is about deeply human things, based on emotions that technology cannot replace, direct doctor-patient contact and empathy being important features in effective and morally accepted medical care, technology must come to their aid.

AI must be integrated, not replace the human part. There is the ability to make everyday life easier, but if it ends up replacing human care altogether, then there is a loss of human closeness, a loss of empathy, and a loss of emotional exchange.

Some interviewees even emphasized the financial side, regarding the current costs.

In conclusion, a partial mistrust of currently available AI technological capabilities and whether they can achieve human-comparable levels of efficacy, adaptability and flexibility in the short and medium term has been highlighted by identifying doubts in technology development and clinical implementation.

Some respondents supported the normative ethical position that care provided by humans cannot and should not be replaced by AI, making the association with medical deontology, particularly the moral obligations of the principles of beneficence and non-maleficence and the importance of maintaining the doctor-patient relationship.

b. Charlotte Blease, PhD, and other colleagues from General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Harvard Medical School, in the 2018 exploratory qualitative study "Artificial Intelligence and the Future of Primary Care: Exploratory Qualitative Study of UK General Practitioners' (GP) Views" following a survey of 720 general practitioners had the ethical issue of AI responsibility and safety in the future of primary care.

Although AI technology can provide more accurate diagnoses and prognoses than humans in some cases, medicine still relies on the physician's clinical judgment in decision-making, as well as their experience in explaining medical information to patients and providing care. It has been argued that the use of technology threatens the quality of patient-centred care, with those involved in the study arguing for the continued need for face-to-face, professional-patient interaction. Scepticism prevailed among those surveyed, with most GPs believing that the scope of the innovation in general practice would be significantly limited.

In particular, some respondents argued that empathy and communication are considered essential human skills and that patients always want health care.

Other participants believed that an effective medical information gathering process requires doctor-patient interaction. Similarly, clinical acumen is often assumed to be a uniquely human skill.

This exploratory study suggests that UK GPs and computer scientists have very different views on the impact of machine learning in primary care.

In contrast to primary care physicians, AI health researchers predict that wearable devices with real-time monitoring capabilities will improve the accuracy of information gathering and reduce unnecessary appointments and medical costs.

GPs expressed three types of comments about future technologies: limitations of future technologies such as lack of empathy and communication, lack of direct patient-centred clinical decision making, increased efficiency benefits, and social benefits and ethical concerns.

Social and ethical concerns include some dissenting ideas, mostly related to uncertainties regarding patient acceptance of such technologies, safety and liability, lack of a larger number of physicians trained in new technologies.

The findings raise important questions about the ability of medical programs to prepare future physicians for potential changes in clinical practice, thus driving and shaping important discussions about the future of patient care. Improving education could help bridge the gap between current health AI researchers and practitioners.

c. Omar Mushabi, in the study published in 2021, in the United Kingdom, "Public patient views of artificial intelligence in healthcare: A nominal group technique study", using the nominal group technique (four groups with seven participants each), validated focused group interview which promotes the generation of AI ethics ideas and issues related to security, bias, data quality, human interaction and accountability.

All participants saw the use of AI in the healthcare sector as a benefit: faster service, 24/7 availability, reduced workload, equality in healthcare decision-making. However, participants also identified issues regarding data security, AI data quality, lack of human interaction, algorithm errors and accountability, technology errors. All of these points fall under three common themes: healthcare data automation, data security, and AI as a decision aid.

AI is a major step in recognizing the importance of ethics, emphasizing human rights. In addition to digital skills training, it is important to design AI systems to reflect the diversity of socioeconomic and health circumstances.

Other important ideas are protecting human autonomy, protecting privacy, inclusion, ensuring security and accuracy, and promoting responsive and sustainable AI. The findings of the study promote the need to further explore the human-computer interface and how human variation and psychosocial need can be accommodated in AI algorithms.

d. Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Ontario, Canada by researchers Jason D. Morgenstern, Laura C. Rosella, Mark J. Daley, Vivek Goel, Holger J. Schünemann and Thomas Piggott have published in 2021 the fundamental qualitative descriptive study of the implications of artificial intelligence for public health "AI's gone have an impact on everything in society, so it has to have an impact on public health" dealing with ethical issues such as bias, fairness and equity. They used semi-structured interviews of 15 public health and AI experts as their method.

In the medical field, it has been reported that the application of AI is equal to or even better than that of doctors in various fields such as radiology, dermatology and pathology. Although AI has received much attention in the medical field, its impact on public health has received less attention. Still, researchers and public health experts are beginning to use AI for a variety of projects, including new Internet searches, suicide prediction using electronic medical records, and risk factor identification.

Participants will explore the potential of AI-based applications to integrate different types of unstructured data in disease surveillance, to integrate more continuously and in a timely manner, and to make better use of large, connected databases.

As AI has the potential to enable completely new approaches to public health, continued creative thinking could help maximize its benefits. In particular, the combination of artificial intelligence and big data will enable new and precise characterizations of decision-makers and their impact on health.

Opportunities for improving public health interventions were also highlighted, including new forms of automated disease screening, personalized health promotion, and the use of social media for health promotion.

As suggested by the participants, investments in artificial intelligence should ideally focus on areas that could reduce inequalities, such as improving access to public health services and health information.

Therefore, there is growing optimism about AI's potential to improve public health. However, very few AI systems are actually deployed in public health agencies. Going forward, there are serious concerns about the impact of AI on privacy, interpretability and the potential for bias.

Barriers to adoption, such as confusion about the applicability of AI, limited capacity and poor data quality, and risks, such as potential subjectivity/injustice/inequity and weak regulation.

e. The study conducted in China by Jie Zhang and Zong-ming Zhang and published in BMC Medical Informatics and Decision Making this year takes a multidisciplinary approach to ethical issues related to data quality, algorithmic errors, safety and security of AI, and attribution responsibilities, the ethical framework of ethical values-ethical principles-ethical norms being used to propose appropriate ethical governance countermeasures for an ethically and legally trustworthy medical AI.

From the title "Ethics and governance of trustworthy medical artificial intelligence" we understand the topic addressed, namely the assessment and analysis of existing and potential AI risks.

Data quality has a direct impact on the quality of medical AI. Medical data mainly comes from heterogeneous data from multiple sources, such as literature data, clinical trial data, real-world data, and health data collected by numerous with the help of smart technologies.

AI systems work only by inputting data, and the responsibility remains with humans. The safety aspects of medical AI present risks and harms that occur during its implementation. Covering a variety of legal and ethical issues, including bugs, cyber security breaches, the need for proper testing and software certification becomes difficult.

While no technology is 100% fool proof, the goal of medical AI should be dedicated to protecting and promoting human health. Limited digital power in healthcare facilities also makes it difficult to ensure data security.

The relevant legal system has not yet been improved, leading to a lack of effective regulations and restrictions on the collection, use and protection of privacy through the protection and streamlining of medical data. Therefore, sharing medical data and protecting patient privacy is also an ethical issue in medical AI applications, as medical data is sensitive information about individuals and has privacy implications. Respect for privacy is an important ethical principle in health care, as privacy is linked to personal identity and autonomy.

It is therefore essential that appropriate steps are taken to obtain patient consent for the use of personal health information. Ethical values lead to ethical principles, and ethical principles result in ethical codes. By combining the influencing factors, the authors

propose appropriate governance measures for reliable medical AI from ethical, legal, and regulatory aspects.

It was found that there are no quality standards, access systems, assessment systems or assurance systems for the application of AI in the medical field, and that the related guidelines and regulatory systems are not yet well established.

Only with the participation of all relevant sectors of society and many parties can we develop ethical and acceptable medical AI.

In order to develop an ethical, acceptable and accessible medical AI, the participation of all the relevant sectors of society is needed. Common to these studies is the fact that all researchers have found the need for informed consent when using data even as a database for AI. The legal system and regulations regarding AI security are necessary, and quite under-addressed, regardless of country. The existence of algorithm errors directly lead to ethical issues such as accessibility, safety and security. Also, a common conclusion is that the responsibility still remains with the human part, not the technology.

What made the difference was the degree of trust in AI, which was better seen and accepted in the US by both professionals and patients. Whether or not AI is useful in care is still being questioned in Europe, but it is recognized as leading the way in investigations and diagnostics.

DISCUSSIONS

The analysis reveals ethical issues generated by the use of artificial intelligence in the provision of medical services. Even if it is about different cultures, different medical systems from the point of view of AI, the studies of recent years highlight the fear that AI could replace the human part of medicine, the suspicion regarding the privacy and security of data.

Just as in China new policies and regulatory systems have been proposed regarding AI, in which all interested sectors participated, so it is recommended that all medical systems implement and update the social and legislative part, so that the beneficiaries have confidence in new technology.

Some doctors have a superficial and unscientific view of the field of medical ethics and mistakenly believe that they have sufficient knowledge and good awareness of medical ethics. One of the biggest challenges in ethics is the lack of adequate education in medical ethics. The existence of negative models represents a potentially significant obstacle to the emergence of a professional and ethical behavior among young professionals, which is mostly due to the gap between theory and practice in terms of ethical aspects, even when it comes to new technologies with which they are more accommodating than experienced professionals.

Responsibility rests entirely with the human side, although sometimes errors may come from algorithms or the lack of quality standards, access systems, evaluation systems, and assurance systems for the application of AI in the medical field.

In a technological and computerized world, doctors face challenges related to data privacy and decision-making supported by artificial intelligence, modern medicine poses new ethical dilemmas.

Across healthcare organizations, there is a growing trend towards the development and use of smart technology. This fact leads to the improvement and efficiency of the services provided to patients, and even to the reduction of costs. As digitization develops, gaining more and more ground even in health services, the risk of cyber-attacks can also increase proportionately, leading to the loss of sensitive patient data, blocking some medical services and even endangering patient safety (EHB, 2022) [27].

From the point of view of ethical and information management, cyber security measures are required in the health system, implemented according to security objectives specific to the health sector, starting with the protection of the confidentiality of medical data, ensuring the integrity of the data, compliance with legal regulations, securing the services of telemedicine and remote monitoring of patients, which following the pandemic have developed significantly. Establishing incident management practices and increasing staff awareness and training, healthcare data integrity systems are in the midst of an ongoing, high-impact digital transformation to interventional practice and, by implication, to patients.

Technological innovations in surgery such as advanced imaging, minimally invasive techniques and automation have brought many benefits, affecting the accuracy of patient operations, reducing intervention time and increasing, most of the time, the efficiency of medical services.

Regarding the state of security in the public health system, both deficiencies and risks can be found, generated by the technological factor (the complexity of the IT infrastructure, outdated equipment) and the human factor (lack of specialists, lack of specialized departments and deficiencies in backup, insufficient training), lack of IT and non-IT personnel training, non-compliance with standards and recommendations regarding ethics and security (Mertoiu, 2020) [21].

This fact would require a continuous training of the employees of the public medical sector, as a result of the introduction of new intelligent technologies in the application of the medical act, both for the provision of medical services from the intervention side, and from the prevention or education side.

The introduction and use of everything that is innovative and equipped with an intelligent component, is seen by some of the actors of the medical services as a vulnerability to the confidentiality and integrity of the medical act, but the trust in the new intelligent technologies is also evident at the institutional level of public health, who managed to overcome some obstacles caused by lack of financial resources or lack of confidence.

Ethical issues and risks associated with technology addiction are ever-present and require additional measures to reduce their impact.

In modern medicine, these can be found in areas such as telemedicine, artificial intelligence, forced testing, involuntary hospitalization, vaccination, end-of-life care, priority testing, biotechnology, medical education and e-health.

The increasing use of medical technologies in all areas of healthcare raises ethical challenges. Similar to the relationship between doctors and medical companies, the relationship between doctors, hospitals and companies that produce medical technologies is necessary, but also involves ethical issues. They appear in educational institutions, where doctors only theoretically learn how to use new equipment from representatives of manufacturing companies, in personal research projects, where doctors collaborate with corporations. Many medical devices are designed to prolong life when drug treatments have failed, so they are often used for patients in very critical situations (BMJ, 2006) [28].

Meanwhile, advances in diagnostic technology allow doctors to detect diseases earlier and more accurately and, in some cases, prevent complex diseases from developing. These technologies promise a new age of preventive medicine. It is important to temper public and physician enthusiasm for the potential of such technology with accurate patient information and appropriate use by physicians (Gelijns *et al.*, 1998) [29].

Recent innovations in medicine and biotechnology can lead to great speculation about what advances will come next. While it is probably true that all doctors, scientists

and bioengineers design and implement medical devices with only good intentions, the pace of development and integration of medical devices into medical practice and other medical fields is slowing. The speed of development makes it impossible to predict all possible outcomes (Gelijns, 1998) [29].

The pace of development and integration of medical devices in practice is slowed by distrust, even if researchers, doctors, bioengineers design quite quickly, which sometimes makes it impossible to predict the results, the implementation of medical technologies being only with good intentions.

For example, a stethoscope symbolizes the connection between the patient and the doctor, but the use of new equipment is seen as weakening the close bond between the two. The use of electronic health records can be involved in scientific studies, improving the quality of medical services and optimizing patient care. This comes with the risk of data being "hacked" and shared for the wrong purposes. In response to the question of when and if consent, even formal consent, is necessary, other ethical considerations arise including ownership of a person's medical records and patient history, with whom it will be shared and who has access to it.

CONCLUSIONS

The purpose of our research study was to identify the medical ethics aspects involved in the use of artificial intelligence in the provision of medical services and the necessity of ethical education. The investigation covered several elements of medical ethics based on ethical principles, ethics education, the existence of ethical issues, and the benefits and drawbacks of new technologies.

Morality and compassion, as a preamble to care, are expressed by doing good. Discernment is especially valuable in decision making, especially when ethical principles collide, and ethical issues arise. Trust begets trust and is a necessary virtue when patients, at their most vulnerable, place themselves in the hands of doctors. Integrity involves the coherent integration of emotions, knowledge, and aspirations, while preserving moral values. Professionals need both professional and personal integrity.

Improving the quality of healthcare services in response to the increasing health needs of patients depends on how careful medical professionals are about ethical principles and openness to new technologies.

Updating regulations and introducing new policies in the medical sector to address the safe implementation and use of AI is a way forward to increase the trust of beneficiaries and professionals, to improve cybersecurity and quality standards, assessment systems and safety systems for the application of AI in the medical field.

Ethics education is essential to support the learning and development of ethical competences in professionals and students training to become professionals.

We believe that medical ethics has not yet been sufficiently disseminated in the health system and it seems that it is not yet sufficiently implemented or well presented in society, even if more emphasis is placed on the existence of ethical codes, on knowledge and education.

There are also ethical issues surrounding the acceptance and use of artificial intelligence in promoting health services. They claim data confidentiality, a better understanding of the patient's condition, but subjectivity or discrimination in medical practice can also occur. Wherever technology exists, there is always the risk of inaccuracy and data breaches, and errors in healthcare can have devastating consequences for patients. This is an

important issue that needs research because there are no clearly defined regulations regarding the legal and ethical aspects of artificial intelligence and its role in healthcare.

Medical artificial intelligence has no moral status, so the responsibility rests entirely with professionals and patients.

Solutions to security and the acceptance of AI for good could come from collaboration between relevant sectors of society and a concern for continuing education on ethics.

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