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Clinical bioethics, deliberation and digitalization of medicine

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Abstract

The development of cognitive technologies and the robotization in health care may intensify the relational distance between healthcare professionals and patients. Therefore, bioethical reflection is essential to find the most appropriate means to integrate the benefits of digital technologies into health care, ensuring ethical care. Thus, bioethics provides healthcare professionals and patients with discursive resources, aiming to enable the most prudent and reasonable decision-making. The exercise of communicative competence is crucial in the process of digitalizing medical activities and in the use of data analysis through artificial intelligence. Deliberative practice and patient-centered medical care are the ethical directives for the introduction of computational technology in medicine, preserving humanized and dialogical health care.

Keywords: Bioethics. Deliberations. Digital technology. Medicine. Artificial intelligence.

Resumo

Bioética clínica, deliberação e digitalização da medicina

O desenvolvimento das tecnologias cognitivas e a robotização no atendimento em saúde poderão amplificar o distanciamento relacional entre profissionais de saúde e pacientes. Diante disso, a reflexão bioética é imprescindível para encontrar o caminho mais adequado à integração dos benefícios das tecnologias digitais ao tratamento de saúde, garantindo o cuidado ético. Assim, a bioética oferece recursos discursivos a profissionais de saúde e pacientes, com o objetivo de possibilitar a tomada da decisão mais prudente e razoável. O exercício da competência comunicativa é crucial no processo de digitalização das atividades médicas e no uso da análise de dados por meio de inteligência artificial. A prática deliberativa e o atendimento médico centrado no paciente são as diretrizes éticas para a inserção da tecnologia computacional na medicina, preservando o cuidado humanizado e o dialógico na atenção em saúde.

Palavras-chave: Bioética. Deliberações. Tecnologia digital. Medicina. Inteligência artificial.

Resumen

Bioética clínica, deliberación y digitalización de la medicina

El desarrollo de las tecnologías cognitivas y la robotización en la atención en salud podrá amplificar el distanciamiento en la relación entre profesionales de la salud y pacientes. Ante ello, la reflexión bioética es imprescindible para encontrar el camino más adecuado a la integración de los beneficios de las tecnologías digitales al tratamiento de salud, asegurando el cuidado ético. Así, la bioética ofrece recursos discursivos a profesionales de salud y pacientes, con el objetivo de permitir que se tome la decisión más prudente y razonable. La práctica de la competencia comunicativa es crucial en el proceso de digitalización de las actividades médicas y en el uso del análisis de datos por medio de inteligencia artificial. La práctica deliberativa y la atención médica centrada en el paciente son las directrices éticas para integrar la tecnología informática en la medicina, preservando el cuidado humanizado y el aspecto dialógico en la atención sanitaria.

Palabras clave: Bioética. Deliberaciones. Tecnología digital. Medicina. Inteligencia artificial.

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In 2018, *The New York Times* reported the case of a French hospital that used the Zora robot in the care of older adults, a device that was controlled by the nursing staff and engaged in games and entertainment activities with patients [1]. This case can illustrate the spectrum of health care in the digital society: the replacement of human labor with the use of robots and humanoids in healthcare relationships.

Given such reality, this reflection article asks whether it is possible to forgo the human capacity to care, show affection and have empathy in a technological and robotic society, or whether it is necessary to rethink how technological innovations are introduced in healthcare, since they can make care dehumanized. The use of artificial intelligence and big data analysis must also be reflected on, which are synonymous with improving medical diagnosis and ensuring digital evolution in medicine, such as IBM Watson for Oncology.

Digital evolution and its accelerated advancement in the context of the COVID-19 pandemic has made digital media and their platforms essential for human relations, increasing hyperconnectivity and data connection in the business environment and social networks. Likewise, digital health care was disseminated in the global health crisis, without any reflection prior to the context of this immersion.

Connected patient data can be an interesting means for healthcare system integration and integrated care. On the other hand, data connectivity may pose a risk to the privacy and protection of personal patient rights. Bioethical principles must thus guide the introduction of technological innovations based on the best interest of patients and the protection of their dignity.

According to the *Universal Declaration on Bioethics and Human Rights* [2], bioethical reflection should seek to achieve a better understanding of the ethical implications of scientific and technological developments and safeguard and promote the interests of the present and future generations. The use of technological devices in health care must thus meet the criterion of human dignity and consider the possible risks of their application. The bioethical dialogue proposes to be multidisciplinary and pluralistic in the understanding of social phenomena and equitable in the sharing of information and knowledge.

Times of uncertainty and evolution in cognitive technology

> *In recent decades, medicine, driven by a context of technological development, has followed the path of science, renouncing its original artistic vocation in the illusion that, by measuring, calculating, executing complex statistical algorithms, exploring the smallest parts of the organism, it would be possible to understand the essence of the human body and correct the fate of each individual* [3].

The impact of technology on medicine implies that healthcare professionals are provided with examination tools for diagnosis and identification of diseases. Consequently, they base their decision-making capacity on the result of examinations and on the prescription of treatment. In some cases, this transfer of decision-making capacity to indicators of the technological tool may not be beneficial to patients, as Lisa Sanders explains:

> *Physicians rely very much on the power of diagnostic tests. And, most often, they have good reasons for that. We have made huge strides in our ability to identify diseases using some kind of high-tech scan. Although medical history and physical examination can often suggest a diagnosis, both physicians and patients like to see hard evidence—and such evidence often comes in the form of the result of some diagnostic examination* [4].

The technological development of medicine has reduced the physicians' ability to conduct accurate reasoning and listen to patients, since the diagnosis already indicates an action to be implemented in the form of therapy by the healthcare professional. Similarly, having several technological tools in the clinical-hospital setting entails the obligation to be omniscient, so there is no possibility of uncertainty in diagnosis and treatment.

> *Complementary exams have changed the way medicine is practiced. Today, with their aid, physicians can have a degree of certainty that is unprecedented in the long history of medicine—regarding certain diagnoses. However, a diagnosis is not established by exams, but by reasoning* [5].

The process of digitalizing medical practice and the healthcare system has led to improved information collection and diagnostic accuracy with the aid of computer programs or artificial intelligence (AI). The expanded medical knowledge and improved clinical diagnosis are the results of work associated with technological innovations and cognitive technologies. However, medical diagnosis refers not only to diagnostic and symptomatic analysis, since it is carried out by examining the patient and learning their biographical history.

> *In addition, obviously, humans have a set of diagnostic tools that computers may never match—five independent and wonderfully powerful sense organs. With a brief observation, physicians can apprehend and process almost immediately a huge amount of information about a patient—their posture, skin tone, type of eye contact, aroma, voice characteristics, personal hygiene, and cues or indicators that are so subtle that they defy verbal description. A computer, on the other hand, only works with words and numbers typed by a human being, which inappropriately represent a living, thinking and highly complex patient* [6].

Despite that, advanced computer programs enable accurate and personalized diagnosis, and the use of AI in the medical field may revolutionize symptomatic analysis and healthcare planning. The so-called "Dr. Google" is the search tool most accessed for self-diagnosis based on symptoms and without medical support. The use of programs and websites for self-diagnosis has led to increasing self-medication in the population.

> *Would a smart, integrated, and super-efficient computer system eliminate all diagnostic challenges? Would it ever replace physicians? Hardly. I believe that the diagnostic process will become more effective and that, in the future, it will be faster and easier to focus on what is really wrong with the patient. However, we will always have choices to make—between possible diagnoses, between tests to be requested and between therapeutic options. Only a well-prepared and knowledgeable human being can make this kind of decision. Moreover, obviously, people do not just need the right treatment for the right disease. They need to be heard, they need comfort, explanations, encouragement, solidarity—all the emotional support that represents a fundamental part of what we physicians try to do: heal* [7].

Medical data digitalization and connection to a computer network will provide enhanced accuracy in medical assessment. However, this process may reduce the human role in decision-making processes with the predictive properties of algorithms (machine learning). Furthermore, with the medical team having several technological tools, there would be a question about the obligation to use the entire apparatus if it is verified that the technological tool does not promote the well-being of patients.

The rise of technologies such as AI, data analysis/data mining by algorithms and their use in medical diagnosis have concerned several international organizations. Institutions such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) [8,9] and the World Health Organization (WHO) [10] are concerned about possible dehumanization in health care. In this context, the digitalization of health care can cause the loss of humanized and holistic care in the follow-up of patients, who would be served through chatbots or artificial intelligence.

> *AI innovations are used today in several areas of modern life, such as transportation, medicine, communication, education, science, finance, law, the military, marketing, customer service, or entertainment. Such innovations raise direct ethical concerns, ranging from the disappearance of traditional jobs, liability for possible physical or psychological harm to human beings, to the general dehumanization of human relations and society in general* [11].

> *Over the years, the development of AI technologies has significantly transformed the landscape of life sciences and medicine, in particular, with positive effects such as improved precision in robotic surgery and better care for autistic children. Despite that, at the same time, these technologies raise ethical issues, such as the cost they entail in the context of scarce resources in the health care system and the transparency they must provide to respect patient autonomy* [8].

Bernard Lown [12] questions the scientific advancement in medicine and the loss of patient trust toward healthcare professionals. The author found that medical practice had lost the art of listening to the patient, replacing it with technological procedures, examinations and surgical interventions. Thus, medical professionals have stopped valuing the biographical human being and have focused on human organic matter; in other words, they have chosen intervention rather than listening.

Therefore, digital contemporaneity must recover the medical practice of listening to patients; thus, patients and physicians enter a partnership as equals [12]. This conduct recovers medicine as an art that prescribes according to the individuality and needs of patients.

Marco Bobbio [3,13] addresses the issue of excessive technology in medical practice and says that it has become complex due to the intensification of specialization and the lack of shared work in the decision-making process by health care professionals. On the one hand, technological advancement in medicine evokes the expectation of offering the "best treatment" with all possible resources and examinations. On the other hand, the obligation to perform surgical intervention or treatment may be ineffective and painful for patients.

Bobbio notes that medical practice has become incapable of dialoguing with the biographical subject and their expectations of what a good life would be. Thus, *with the growth of the scientific component, medicine has lost the human component. Patients are spoken to with numbers, and no longer with the heart* [14].

Medicine without limits is the belief in the effectiveness of machine judgement and the devaluation of the human ability to feel and approach the patient. This reductionism is a result of the reliance on the predictions of technical devices and the overvaluation of technologies. According to the Italian author, technological enhancement has induced mechanical and impersonal behavior in the treatment of patients by health care professionals [3].

> *Today's medicine assumes that all diseases originate from a biological alteration. However, our well-being also depends on several other factors that cannot be investigated through laboratory tests, nor treated with drugs or surgical interventions: work, interpersonal relationships, economic conditions, the environment where we live, emotions, feelings, hopes. These are often the primary causes of illness* [15].

In addition, technological advancement influences the application of new techniques without proper reflection on the benefits and harms of their use, and medical practice has been co-opted by commercial and marketing interests for the prescription of medicines. The commercial interest in the supply and media popularization of drugs is a problem to be faced by healthcare professionals, so as not to be accomplices or hostages of economic harassment.

> *This is not a matter of taking a simplistic position for or against technology, but of preventing medical practice with no reflection on its limits or with the mistaken view that the more is done, the better. It is necessary to avoid the indiscriminate use of instruments whose impact on the diagnostic and therapeutic course of patients is still unknown* [3].

Therefore, Bobbio warns that excessive testing does not mean an improvement in the patient's quality of life, and may have the harmful effect of making them more anxious and unhappy about their state of health. Medical reasoning must analyze whether the new drug or the technological device is really better and generates more well-being and quality of life for the patient. Thus, *the technology is not good or bad in itself, but* (...) *its application, in a given patient, may or may not be appropriate* [16].

Constructive dialogue with the patient can contribute to the best choice of health care and avoid unnecessary and inefficient therapies. This communicative interaction between physician and patient aims to make the professional understand the scientific data, the interpretation and the experience of the patient.

> *It is necessary to learn to exercise our therapeutic and charismatic power with care, self-control and humility. Medicine has lost the perception of the human being, leaving only the perception of treatable health problems* [17].

The subjectivity of health professionals and patients must be integrated into the shared decision-making process. On the other hand, the technological model of medicine disregards intersubjective action and is based on results of diagnoses and recommendations of technical evaluations.

> *Modern physicians believe that technical evaluation is the only appropriate evaluation, giving patients, at most, the right to accept or reject it. However, there should be room for assessment of the patients' uniqueness, determined by age, economic and cultural conditions, personal and psychological situation, and greater or lesser desire to collaborate and be an active part in the decision-making process.*

Bobbio [3] considers that the technical-scientific knowledge of health care professionals must be confronted with the subjective experience of their patients. The physician-patient relationship needs to be informed by empathy and affection in health care, so that the therapy proposal is based on the patient's biological and biographical individuality, as Luigi Pagliaro explains:

> *Sensitized by this experience, they propose suggestions to improve the relationship and communication between physicians and patients: to stay at the patient's bedside to write their history and update the medical record, without being isolated in a separate nursing station, to allow a few minutes for the patient to tell (without an audience of other patients or physicians) how they feel and how they are; to apprehend their non-verbal expressions (interrogative, anxiety, fear), often more expressive than words, and give them answers; not to ignore the problems present or close to the family; to respect their dignity and care for the many aspects of palliative therapy* [18].

The reflection on the physician-patient relationship is based on the ethical principles that should guide the communicative and deliberative process. In this context, moral conflicts arise—which are intensified with the digitalization of health care. Clinical bioethics deals with these conflicts, to which health care professionals need to provide the most appropriate response on a daily basis. Thus, medical reasoning is led to rethink its role, as well as to assess the use of technological tools and the prescription of drugs that can really improve the patient's clinical condition.

Clinical bioethics and deliberation for the digital society

Because not everything that is technically possible is ethically correct [19], clinical bioethics has developed as a field for analysis of the moral conflicts experienced in the decision-making practice of health care professionals in different establishments. This field deals with subjects of the physician-patient relationship, deliberative-decision process, and well-being and quality of life of patients. *Concrete decision-making can never be strictly scientific, but must be conducted in a technical and prudent manner* [20].

This means that health care professionals must exercise their reflective capacity in accordance with ethical principles and prudence. According to Gracia, *clinical bioethics is the application of this entire conceptual system to the specific field of human clinical practice* [21], which is the place of discursive interaction between health care professionals and patients. Therefore, in a clinical sense, bioethics contributes to the analysis of moral conflicts and to the desire to value the well-being of patients in their needs.

The analysis of Diego Gracia [19,20] on clinical bioethics emphasizes the connection between clinical issues and ethical principles. Thus,

the meaning of the medical practice is to be the space of communicative and deliberative interaction between health care professionals and their patients.

The Spanish thinker revisits the classic meaning of the medical practice in the physician-patient relationship through dialogic interaction in the desire to provide patients with the appropriate health treatment. Thus, he clarifies that medical practice issues differ from pathology issues, as, in medical practice, the treatment is not focused on the disease in its evolution, but on the patient, since they are considered the center of health treatment.

> *Medical practice does not consist in abstract and theoretical study of diseases and their cure, but in the activity that physicians conduct with specific people, those who are ill or bedridden. That is how medical practice differs from pathology. The object of study of pathology is "the disease* [22]*, while the medical practice focuses on the "patient," trying to identify the disease that affects them and how to treat it. Differently from pathology, the issue in medical practice is not knowing about pulmonary tuberculosis as a morbid species, but to determine whether a specific patient suffers from pulmonary tuberculosis.*

In ancient and Hippocratic medicine, ethics and medical practice were inseparable concepts, and Aristotle [23] instituted practical reasoning in the medical art as the ability to deliberate with prudence and just measure. Thus, medical decisions should represent careful consideration of the patient's condition.

In modernity, on the other hand, there was a dissociation between practical (ethical) reasoning and medical technique, and speculative reasoning became preponderant in medical and specialized practice. This led to the distancing in the physician-patient relationship and the loss of a holistic perspective in medicine.

> *The medical practice is not a science, but an art or technique, which must be exercised with knowledge, but also with prudence, which is the ethical virtue par excellence. That is the reason why medical practice and ethics have always been closely associated. Both have to make particular decisions and therefore need to elevate the detailed analysis of specific cases to the category of method* [24].

Therefore, the recovery of the medical art through ethical principles must consist in the careful and reflective analysis of the patient's clinical situation and in the act of deliberating according to reflection considering principles and values. Deliberation is the most appropriate method and procedure for the resolution of moral conflicts in contemporary society [25,26].

Moreover, the analysis of clinical bioethics shows that ethical issues are interconnected with technical-scientific issues. The need for individualized patient care and the adoption of protective measures for vulnerable individuals and populations are duties of bioethics in its primary foundation [27]. Therefore, the deliberative procedure expresses the observation of the circumstances and consequences of a fact (clinical case) that needs the most appropriate, wise, reasonable and prudent clinical decision, which should promote the ethical values necessary for its implementation [28].

According to Gracia [29,30], the deliberative process begins with the recognition of the moral conflict, and *deliberation requires the active participation of all, who must observe themselves what is being said* [31].

> *Let us now return to the topic of conflict of values. Values only come into conflict when moving from the second world to the third world, when moving from axiology to ethics, that is, when it comes to realizing values* [32].

This conflict can refer to the fact, values and deliberation: the fact concerns the perception of a problem situation that requires moral reasoning about the right thing to be done; conflicting values can refer to various types of values (economic, cultural, moral, religious, legal, aesthetic and logical) that can be evaluated in the problem situation (case); and deliberation involves the recognition of a moral obligation (duty) to be fulfilled by the moral agent who reasons based on the fact and the values appreciated for the resolution of this moral conflict.

In moral deliberation, critical reasoning has three levels—fact, values and duty—and the levels

of deliberative reasoning are structured into eleven stages:

- The level of fact is in the presentation of the problem: clinical case (1) and knowledge of the factual conditions for moral evaluation and diagnostic, prognostic and therapeutic decision-making (2). This first level performs the contextualization of the problem situation and evaluation based on the "best possible knowledge and technologies."
- The level of values begins with the recognition of the problem on which it is necessary to deliberate (3) and its identification as an ethical problem (4). Similarly, values that are in conflict are identified (5).
- The third level encompasses moral deliberation and analysis of what can be done to resolve the moral conflict (6) and the identification of courses that are characterized as decision between extremes (excess and lack) (7). Moral reasoning indicates prudential choice and the search for intermediate courses (balance, just measure) (8). The final decision (9) will be informed by the realistic and feasible way of acting in situations of moral conflict and must be evaluated in accordance with the criteria of legality, publicity and temporality (10). This means that the well-judged decision must respect the laws in force, and the justification for the deliberation must be public and accessible, so that it can be reviewed in other situations and modified over time. After this deliberative and experimental process, it can be configured as a definitive and prudent solution (11).

The deliberation on the best course should constitute a prudent and judged decision. As Gracia explains, *the method does not intend unanimity in the decision, nor can it be considered a failure if unanimity is not reached. What the method intends is that all decisions that are made, one or more, are prudent* [33].

The prudent decision is the best judged considering the other decision-making possibilities. The deliberative method represents the reflective activity of daring to think new ways to ensure qualified and human-centered health care. Deliberate action demonstrates the rational ability to judge practical issues with a sense of fairness and in accordance with the just measure.

In summary, the deliberative exercise in the digital society will lie in the reflective and communicative interaction between health care professionals and patients to promote quality health treatment and considering ethical principles.

> *Our duty is always to choose the best values and make them a reality to the best of our ability. Duty is always based on value and consists in the realization of values, just as value is always supported by facts. In such a way that the resolution has to follow an order: from the analysis of the facts we have to move on to the identification of the values that support these facts, and from there to the third level, to the determination of our duties, which will always consist in the optimal realization of the values at stake* [34].

The deliberative method, proposed by Diego Gracia, suggests prudence in the use of cognitive technologies in health care. This reflective procedure emphasizes the discursive interaction and the understanding of the best means for the analysis of the patient's clinical situation. It avoids "therapeutic and technological obstinacy," which consists in acting voraciously in the use of technological devices to justify uncertainties and aporias in health care.

The indispensability of human care and the expression of affection in health care must be consistent with the use of robotic and cognitive technologies. Thus, the analysis of the diagnosis by a human being in contact with the patient needs to be the foundation for the digital society and the health care professional must show affection towards the patient.

Fogel and Kvedar consider that artificial intelligence in health care can contribute to more humanized care, reducing the period of clinical diagnostic analysis and increasing the time in contact with the patient:

> *By adopting AI, we believe that humans in health care can increase the time spent on uniquely human skills: building relationships, exercising empathy, and using human judgment to guide and advise* [35].

Clinical decisions should prioritize the deliberative capacity of the multidisciplinary team

with the aid of AI systems and consider the well-being of patients, their consent, and the goal of valuing their life experience and values.

Consistently, Warraich, Califf and Krumholz say that the digital transformation of medicine could foster patient-centered care through cognitive computational analysis and improved data analysis. According to the authors:

> *Technologies, which optimize physician workflow and help provide more time with patients, either in person or through other means, could revitalize the physician-patient relationship and perhaps also improve clinical well-being* [36].

The process of digitalization in medicine may contribute to a more accurate analysis of clinical facts and comparison of information in a database (big data). Health care professionals should be aware of their ability to evaluate cognitive technology data and the values that may conflict. This deliberative activity always needs to consider the duty to provide patient well-being and ensure patient-centered care.

> *The digital transformation of medicine has the potential to make health care more human and personalized; however, several important steps are required to avoid pitfalls related to previous interactions of information technology in medicine. Both patients and physicians should be involved early on in the stages of medical technology development to ensure they are person-centered.*

Warraich, Califf and Krumholz [36] note that the physician-patient interaction must consider data security principles, in addition to transparency in the clinical-deliberative process. These ethical principles are the directives for discursive interaction to occur in a respectful manner and for the benefit of the patient.

Moral deliberation in the digital society is the most appropriate course for prudential and reasonable decision-making. Cognitive technologies and robotization in medicine will enhance the analytical capacity of health care professionals. However, the decision-making capacity must remain under human supervision, as the most appropriate health treatment transcends technological means and is part of the reflective and communicative capacity of health care professionals to provide due care to patients.

As Zoboli [37] explains, in deliberation, professionals think together, share their perceptions, that is, they put in dialogue several moral meanings. Different perspectives of reality are important to improve the moral sense, as it is collective and not only individual. The deliberative procedure is a resource to aid the ordering of discussions on ethical issues, through sequential steps.

Technological advancement has contributed to the improvement of patient data analysis, enabling the evaluation of multiple prognoses that can ensure well-being and the best treatment. The deliberative procedure between health care professionals and patients assists in understanding the ethical implications in decision-making and supports the most prudential and reasonable choice.

The deliberative method is dynamic and can be made compatible with the digital way of evaluating clinical situations based on informational and cognitive flows suggested by artificial intelligence and software. Shared human decision must prevail over the dictates of the software when it preserves the dignity and quality of life of patients.

Final considerations

Digital transformations in health care have raised several questions about the ethical implications of their introduction in the care of patients. The physician-patient relationship involves the analysis of information and data and by the performance of diagnosis and prognosis. Thus, the use of cognitive technologies provides support to enhance the analytical and predictive capacity of health treatments in comparison with the information contained in a database (big data).

Questions within the scope of clinical bioethics are based on concern for the quality and dignity of human life. The deliberative method differs from the speculative and analytical-predictive reasoning of cognitive technologies because it presupposes the use of the sensitivity and life experience of health care professionals, and consideration of the biographical elements of the patient.

Deliberative reasoning consists in the use of evaluative capacity and bioethical references to make the most prudential and reasonable decision. It stands out for its dynamism and communicative role in the exchange of perceptions and propositions in better evaluating clinical conditions and making the best recommendations for health treatment.

The theoretical references contributed to the bioethical reflection on multiple aspects of the introduction of cognitive technologies in health care settings. Risks and advances in the application of artificial intelligence in health care should be considered for the promotion of the common good and the dissemination of best health care practices to the most vulnerable populations and individuals.

Ethical conduct in the digital society presupposes the sharing of ideas and life experiences for the construction of a more equitable and egalitarian society. Cognitive technologies can bring people closer through connection on digital platforms, being the course to improve the quality of life for all people.

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