


Chapter 3

Ethical Aspects of Information–Based Medicine (With a Focus on Mental Health)

Jan Kalina

 <https://orcid.org/0000-0002-8491-0364>
ICS CAS, Prague, Czech Republic

Nicole Tobišková

ICS CAS, Prague, Czech Republic

ABSTRACT

Modern advanced tools of artificial intelligence assist healthcare professionals in a variety of complex tasks related to medical care. Digitalization and automation accelerate the development and deployment of innovative artificial intelligence tools tailor-made for clinical applications; decision support systems represent an important example of such tools. This chapter is devoted to discussing the role of artificial intelligence in current and prospective medical care and ethical aspects of their deployment. As developed countries currently go through remarkable transforms of medical care involving informatization and centering around medical information and knowledge, this chapter also discusses future ideals of medical care characterized by the concept of information-based medicine. Ethical and patient safety implications of using artificial intelligence within information-based medicine are overviewed here. Specific attention is paid to mental healthcare and ethical aspects of using artificial intelligence in its context.

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INTRODUCTION

The whole society worldwide is affected by the COVID-19 pandemic and seems to undergo the most dramatic progress in the history of humankind. Naturally, medical care can hardly remain untouched by the negative impact of the pandemic but may at the same time benefit from new perspectives and opportunities (Alimadadi et al., 2020). Indeed, after the outbreak of the COVID-19 pandemic in 2019 caused by the SARS-CoV-2 coronavirus, medical care has experienced complex transforms basically in all countries around the world (Sigurdsson et al., 2020).

The digitalization and automation contribute to an increasing availability of big medical data (Lin & Hou, 2020). Innovative tools of artificial intelligence (often abbreviated as AI) allow to obtain new medical knowledge from the available big medical data (Tripathi, 2021). The digitalization and automation (including deployment of robots) have enabled development and deployment of modern telemedicine tools such as clinical decision support systems. The information technology contributes to a paradigm shift from medical care approaches formulated for an average patient towards personalized approaches based on specific medical knowledge obtained for a particular individual patient. Further, artificial intelligence has a potential to interconnect very particular medical specialties and to overcome the granulation (or fractalization) of current medicine by offering a holistic approach to clinical care for an individual patient. This chapter is devoted to ethical aspects related to deployment of artificial intelligence in medical care, with a focus on the transforms of medicine from evidence-based medicine towards prospective ideals denoted here as information-based medicine. An array of issues related to the use of artificial intelligence in medical care is presented here with a particular focus on the field of mental health.

On one hand, we currently experience the boom of artificial intelligence tools for healthcare applications. On the other hand, ethical issues of using artificial intelligence in healthcare are often reduced to technical (software engineering) problems of data privacy, anonymization, confidentiality, and sharing, without paying attention to a broad spectrum of other ethical issues. A more complex overview of ethical aspects of artificial intelligence in healthcare in general and particularly in specific fields of clinical care thus remain to represent a hot interdisciplinary topic connecting the worlds of ethics, medicine, medical informatics, or computer science. This paper fills the gap of a missing broad discussion of diverse topics of using artificial intelligence in general, with a focus on mental healthcare, where the ethical debates still have not come to generally acknowledged conclusions.

The chapter has the following structure. The next section introduces basic concepts of artificial intelligence and machine learning. An overview of selected inspiring health-related artificial intelligence applications follows, documenting the recent

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