Chapter 11
Exploring the Ethical Implications of Generative AI in Healthcare

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ABSTRACT

This chapter critically evaluates the ethical challenges posed by the advent of generative artificial intelligence (GenAI) in healthcare. It investigates how GenAI's potential to revolutionize patient care and medical research is counterbalanced by significant ethical concerns, including privacy, security, and equity. An extensive literature review supports a deep dive into these issues, comparing GenAI's impact on traditional healthcare ethics. Through case studies and theoretical analysis, the chapter seeks to understand GenAI's ethical implications thoroughly, aiming to contribute to the development of nuanced ethical frameworks in this rapidly advancing area.

INTRODUCTION

The emergence of Generative Artificial Intelligence (GenAI) in healthcare marks a significant milestone, heralding a new epoch in the confluence of medical science and technological innovation. This chapter critically examines the ethical dimensions inherent in this groundbreaking development. It is defined as AI that generates novel content or data through machine learning algorithms and neural networks (Goodfellow et al., 2016). GenAI is poised to transform healthcare in unprecedented ways. However, this transformative potential necessitates a thorough scrutiny of its ethical implications.

GenAI's introduction into healthcare signals a transformative shift in offering benefits ranging from improved patient care to groundbreaking strides in drug discovery and predictive analytics. Despite these advancements, the integration of GenAI also brings complex ethical challenges. Paramount among these are concerns regarding patient privacy, data security, informed consent, and the potential exacerbation of existing healthcare disparities. This chapter aims to dissect and critically analyse these ethical dilemmas, focusing specifically on how genAI is reshaping the landscape of healthcare ethics.

This chapter employs a multifaceted methodological approach to explore the ethical dimensions of genAI in healthcare thoroughly. This approach's core is an extensive literature review, which serves as the foundation for our inquiry. This review encompasses a broad range of scholarly articles, research papers, and case studies at the intersection of AI, ethics, and healthcare. The goal is to capture diverse perspectives and trace the evolution of AI's role in healthcare, particularly focusing on its ethical ramifications. This comprehensive review of the literature ensures that our analysis is anchored in the latest knowledge, incorporating a variety of viewpoints and research findings.

A key component of our methodology is comparative analysis. We highlight AI technologies' distinct challenges and opportunities by juxtaposing the ethical issues of generative AI against those in traditional healthcare practices. This comparison aids in discerning how generative AI intersects with and diverges from existing ethical norms and standards in healthcare.

We also engage in detailed case study evaluations, examining instances where AI has been implemented in healthcare settings. These case studies serve as practical examples of the ethical considerations in action, showcasing successes and challenges in real-world scenarios. Analysing these cases provides tangible illustrations of how ethical issues manifest in practice.

Moreover, we apply theoretical frameworks from ethics and AI research to the specific context of healthcare. We also delve into AI-specific ethical frameworks proposed by contemporary researchers. This theoretical foundation is crucial for developing effective strategies for addressing ethical challenges.

OBJECTIVES OF THE CHAPTER

- To provide an in-depth overview of the applications and potential of generative AI in healthcare.
- To identify and articulate the key ethical issues of deploying generative AI in healthcare.
- To thoroughly examine the complexities and broader implications of these ethical challenges.
- To develop ethical frameworks and strategies to address these concerns.

EXPLORATION OF CURRENT APPLICATIONS OF GENAI

The integration of GenAI into healthcare has revolutionised various aspects of medical practice and research. This section explores the current applications of generative AI in healthcare, illustrating its transformative impact.

Drug Discovery and Personalized Medicine: One of the most groundbreaking applications of generative AI in healthcare is in drug discovery. Researchers can rapidly identify and synthesise new drug compounds by leveraging AI algorithms, significantly accelerating drug development. This has been particularly valuable in the search for treatments for complex diseases like cancer and

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