

The Impact and Implication of Artificial Intelligence on Thematic Healthcare and Quality of Life

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ABSTRACT

Artificial intelligence (AI) in healthcare is utilized to define the application of machine learning (ML) technologies or algorithms to replicate human cognitive abilities regarding the understanding, presentation, and analysis of sophisticated medical procedures and healthcare information. This article discusses the impacts and implications of AI on QoL and healthcare. The thirty-two articles included in the dataset for this study were algorithmically retrieved through a systematic search on four multidisciplinary databases, including PubMed, JSTOR, ScienceDirect, and Medline. This thematic analysis identified and discussed the following themes: AI and sustainability; the potential risk of automation bias; healthcare ethics; AI and quality of life regarding security and safety; and bias in artificial intelligence technologies. Impact-related graphs of the different AI systems and healthcare dynamics are also included in the narrative. Population safety, security, racial bias, and proactive systems are identified as potential and perpetual challenges.

KEYWORDS

AI Applications, Bias, Bioethics, eHealth, Ethics, Machine Learning, Telehealth, Telemedicine

INTRODUCTION

The phrase artificial intelligence (AI) in healthcare is used to define the application of machine learning (ML) technologies or algorithms to replicate human cognitive abilities regarding the understanding, presentation, and analysis of sophisticated medical procedures and healthcare information. AI was primarily introduced in the healthcare industry to enable clinicians and other healthcare practitioners to accurately and efficiently analyze the association between patient outcomes and clinical techniques and help improve those techniques. Various studies demonstrate that AI has considerably affected the healthcare industry and the QoL in several positive and negative ways. Its impacts on the healthcare industry are evident in cardiovascular, telemedicine, telehealth, electronic health records, dermatology, gastroenterology, infectious diseases, primary care, psychiatry, and pathology (Davenport & Kalakota,

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2019). The significance of AI in humanity's QoL is witnessed in such areas as music and streaming services, banking, credit fraud elimination, navigation and travel, transportation, social media, chatbots, education, digital assistants, and security and surveillance.

Nonetheless, various studies demonstrate the negative impacts of AI on the healthcare industry, QoL, and current and future generations (Bohr & Memarzadeh, 2020). This article discusses AI technology and the mechanisms underlying its workability. We employ quantitative and qualitative research techniques to identify various themes evident in different studies regarding the impact of AI on QoL and the healthcare industry.

The Concept of AI

AI has received enormous attention from various disciplines and stakeholders, including healthcare, engineering, manufacturing, philosophy, economy, and politics. AI is a science of human intelligence that aims to study the understanding, knowledge, and nature of human intelligence. AI strives to make machines similar to human beings by enabling them to comprehend complex mental processes during the thinking process and perform complex calculations. As a result, machines can simulate human behavior and carry out various tasks that could have been performed only by human beings in the past (Davenport & Kalakota, 2019). To understand the concept of AI and its impact on healthcare and QoL, it is essential first to know the types or stages of AI and the mechanisms underlying each type or stage.

Artificial Narrow Intelligence (ANI)

ANI is also known as weak AI. This type of AI involves computerized machines that can carry out only a narrowly defined set of particular activities. At this stage, the AI enabled-machine cannot process any activity that requires thinking and can perform only a set of predefined actions. Numerous examples of weak AI include Google Assistant, self-driving automobiles, Alexa, and Alpha-Go.

Artificial General Intelligence (AGI)

AGI is also known as strong AI. It is the stage in the development of AI where computerized machines are predicted to possess the capacity to think like humans and make informed decisions. Currently, there are no examples of AGI, but various stakeholders believe that humanity will soon develop machines that are intelligent as humans. However, some researchers, such as McLean et al. (2021), believe that strong AI will pose a substantial threat to the existence of humanity. According to Cellan-Jones (2014), Stephen Hawking stated that the development of AGI could mean the distinction of society because strong AI might take off on its own and reprogram and reproduce itself at an alarming rate. Their population would surpass humanity's because humans are limited by slow biological evolution and would not match AGI.

Artificial Super Intelligence (ASI)

ASI is the stage of AI development where computerized machines' intelligence and thinking capacity will surpass human beings. Currently, ASI is only hypothetical and often depicted in science fiction movies and books. Vaast (2022) states that, based on technological advancement, ASI will probably become a reality in a few decades. The rate of technological advancement and AI development is incredibly fast. Besides healthcare, AI is used in various fields, such as scientific research, learning, and daily activities. AI can also be categorized based on its functionalities in multiple areas. Figure 1 shows the functionalities of AI in different fields.

The types of AI based on functionality include reactive machines AI, limited memory AI, self-aware AI, and theory-of-mind AI. Reactive machines AI involves machines that use present data for their operations and consider the current situations only when performing their functionalities. These machines cannot form inferences from data; hence, they cannot use the present data to evaluate future events or activities. Reactive machines AI can carry out only a narrow range of predefined

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