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Title

**Explaining the Effects of metaverse on the functions of teaching hospitals,
providing a preparation solution**

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Abstract

Introduction and Objectives: Teaching hospitals are highly complex due to their multi-functional nature, encompassing therapeutic, health, research, and educational departments at various levels. This complexity makes their management and administration challenging. The use of modern technologies offers a valuable opportunity to reduce this complexity, improve service quality, and accelerate treatment and educational processes, thus taking a significant step toward enhancing the healthcare system. One such modern technology is the *Metaverse*, which, through the integration of artificial intelligence, virtual reality, augmented reality, and the Internet of Medical Things, provides new capabilities across various dimensions of teaching hospitals. However, if these changes are not accompanied by proper preparedness, they may be perceived as a threat rather than an opportunity for progress. This study aims to examine the effects of the Metaverse on the four main functions of teaching hospitals and to propose strategies for preparing these institutions to confront Metaverse technology.

Method: This qualitative study was conducted in three stages. In the first stage, a scoping review of literature and relevant documents was conducted to identify the theoretical foundations and dimensions of the Metaverse's impact on teaching hospitals. The second stage involved conducting semi-structured interviews with national experts and analyzing the data using a framework analysis method to extract the potential effects of the Metaverse. In the third stage, a panel of experts was convened, and a consensus was reached on the findings using the framework method, resulting in strategies for effectively facing and utilizing the Metaverse in teaching hospitals.

Findings: The findings indicated that Metaverse technology has significant impacts on the four main functions of teaching hospitals: treatment, education, research, and health. Opportunities created by this technology include facilitating clinical education interactions, improving access to research data and resources, enhancing the quality of healthcare through virtual reality simulations, and promoting public health services through remote patient monitoring and management. On the other hand, challenges such as the need for advanced technological infrastructure, cultural resistance to change, staff training requirements, and concerns regarding data security and patient privacy were also identified. The prerequisites for successful Metaverse adoption include the provision of IT infrastructure, the development of digital skills among clinical and academic staff, and the formulation of protective policies and strict regulatory mechanisms. This technology, by transforming treatment, educational, and research processes, is capable of enhancing the efficiency

and quality of services in teaching hospitals. Ultimately, to optimally benefit from the Metaverse's opportunities and manage its challenges, it is necessary to design and implement management and educational policies tailored to the specific functions of each hospital department.

Conclusion: The results of this study show that implementing Metaverse technology in teaching hospitals brings both opportunities and challenges across the four core functions of treatment, education, research, and health, necessitating the establishment of the required structures and infrastructures for its effective implementation. The study revealed that this technology can transform all levels of teaching hospitals and lead to the revision and redefinition of existing processes. In this regard, purposeful attention to technological, infrastructural, managerial, and educational requirements is a fundamental condition for the hospital organization's preparedness in the face of this transformative technology. To effectively benefit from the Metaverse's advantages, it is essential to consider both short-term requirements and long-term prospects through an integrated perspective. Initially, existing challenges in treatment, education, research, and health must be identified and effectively managed to leverage present opportunities. In the long term, by adopting a systems approach focused on the key functions of teaching hospitals and utilizing change management strategies, the foundation can be laid for institutionalizing and sustainably developing Metaverse technology. This study is relevant for teaching hospital managers, healthcare policymakers, and designers of applied modern

technologies who seek to use the Metaverse to enhance treatment, education, research, and health services.

Keywords: Metaverse, Hospital Functions, Academic Medical Centers, University Hospitals, Readiness Strategy, Virtual Reality, Augmented Reality