Ankyra Medical Journal
Letter to the Editor
DOI: 10.51271/ANKMJ-0028

Augmented and virtual reality in medicine

Murat Erdağ
Department of Ophthalmology, Fırat University, Elazığ, Turkiye

Cite this article: Erdağ M. Augmented and virtual reality in medicine. *Ank Med J.* 2024;3(5):124-125.

Received: 01.09.2024 ◆ **Accepted**: 16.09.2024 ◆ **Published**: 30.09.2024

Dear Editor;

I've read the article, titled 'Exploring the competence of artificial intelligence (AI) programs in the field of oculofacial plastic and orbital surgery'[1] published in your journal, with great interest. The fact that your groundbreaking and innovative article is related to AI and large language models (LLM) prompted me to write you a letter regarding the other side of the AI spectrum, particularly augmented reality (AR) and virtual reality (VR) in medicine.

In recent years, the use of AR/VR applications has significantly increased, particularly in medical fields such as ophthalmolgy, plastic surgery, cardiovascular surgery, general surgery dermatology etc. and in dental medicine. The primary uses of AR/VR in medicine can be categorized into; education, surgery, and diagnostics.[2] These technologies hold great promise for applications across various fields, including healthcare, education, engineering, design, manufacturing, retail, and entertainment. While VR creates an immersive experience that is separate from the real world, AR overlays virtual images, fostering interaction between the user, the digital content, and their physical surroundings.

The review of current scientific literature examines the role of VR and augmented reality (AR) in the medical field. These technologies are most frequently applied in areas such as diagnostics, surgery, rehabilitation, and mental health care, offering considerable promise in enhancing patient outcomes. VR and AR have been particularly effective in managing conditions like pain, stroke rehabilitation, and neurodegenerative diseases. Although research in this area has grown rapidly, there remains a need for further refinement and standardization to maximize their potential in clinical practice.[3]

Pottle'[4] article explores the transformative potential of VR in medical education. VR provides immersive, interactive learning experiences that allow medical students to practice clinical skills in a simulated environment, offering an effective and resource-efficient alternative to traditional simulation methods. The technology's ability to deliver repeatable, standardized scenarios on-demand supports autonomous learning and reduces the need for faculty involvement, making it accessible to a wider range of students. Additionally, the article highlights VR's potential to democratize medical education by overcoming geographical barriers and enhancing interprofessional learning across healthcare systems.

Carvalho's[5] study explores the use of VR in ophthalmology education. VR has emerged as an auxiliary tool in medical education, particularly in delicate specialties like ophthalmology, where it is used for training and therapeutic simulations. The research highlights that VR applications in ophthalmology are still limited, but the technology holds significant potential. Especially in surgical training, VR simulators enable students to repeatedly practice complex procedures. As a result, VR represents a major innovation in both ophthalmology education and treatment.

In conclusion, AI and AR/VR are complementary technologies. While AI makes AR and VR applications smarter, more realistic, and interactive, AR and VR technologies effectively present the information provided by AI to the user in a visual and auditory manner. When used together, they give rise to groundbreaking applications, especially in fields such as healthcare, education, entertainment, and manufacturing.

ETHICAL DECLARATIONS

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

Corresponding Author: Murat Erdağ, mderdag@gmail.com

REFERENCES

1. Şensoy E, Çıtırık M. Exploring the competence of artificial intelligence programs in the field of oculofacial plastic and orbital surgery. *Ankyra Med J.* 2024;3(3):63-65.
2. Gençoğlu Ş. Enhancing dermatology: the current landscape and future prospects of augmented and virtual reality technologies. *J Health Sci Med.* 2024;7(1):132-136. doi:10.32322/jhsm.1358284
3. Yeung AWK, Tosevska A, Klager E, et al. Virtual and augmented reality applications in medicine:analysis of the scientific literature. *J Med Internet Res.* 2021;23(2):e25499. doi:10.2196/25499
4. Pottle J. Virtual reality and the transformation of medical education. *Future Healthc J.* 2019;6(3):181-185.
5. Carvalho JA. Ophthalmology and virtual reality. *Rev Bras Oftalmol.* 2012;71(1):40-47.