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Response to "the Future of Pain Medicine: Emerging Technologies, Treatments, and Education" [Letter]

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Dear editor

We commend the authors of the recent narrative review, The Future of Pain Medicine: Emerging Technologies, Treatments, and Education, which highlights the importance and potential of innovative technologies and therapies in the field of pain medicine and explores the use of virtual reality, wearable technology, artificial intelligence, and psychedelics in the treatment of chronic pain.[1] Efforts to introduce emerging technologies into the field of pain medicine are necessary and timely. However, several key issues require further investigation.

First, the authors did not strictly control for individual differences in the included patients, and it may be difficult to generalize the findings to a broader population, as variables such as age, sex, pain type, and underlying health conditions have significant effects on treatment outcomes.[2] Responses to emerging technologies and treatments can vary widely among patients, and ignoring this may limit the generalizability of the findings to practical applications.

In addition, the technical complexity and multidisciplinary integration problems have not been addressed. Emerging technologies in pain medicine, such as artificial intelligence-integrated neuromodulation, virtual reality, and wearable device collaboration, involve interdisciplinary knowledge in medicine, computer science, psychology, and other disciplines. However, professional barriers in various disciplines make it difficult for researchers to fully master technical principles and application details, thus restricting the in-depth application of technology.[3]

Although the review mentions the potential of emerging technologies in pain medicine and some preliminary research results, it does not delve into the specific procedures, scope of application, or long-term effects of these technologies in clinical practice. For example, although VR technology shows promise in the treatment of chronic pain, there is a lack of detailed analysis of the differences between different types of VR devices and programs, and the best application mode for different chronic pain conditions.[4] Another area of concern is accessibility; this review does not account for the differences in the accessibility of emerging technologies and treatments in different regions and at different levels of medical resources. For example, emerging technology equipment may be more readily available in developed areas or large medical centers; however, it may be challenging to popularize in remote areas or primary medical institutions.[5] Therefore, a solution or response strategy to address this issue is essential.

To conclude, this systematic review provides valuable insights into the future of pain management. However, the complexity of adopting emerging technologies should be considered. Future reviews should strengthen stratified patient studies, set standards, analyze efficacy differences through large-scale trials, build predictive models, and improve research generalizability and accuracy. Interdisciplinary collaboration platforms and professional training mechanisms should be developed to overcome professional barriers and effectively integrate technology into pain medicine. A technology evaluation and resource balance system should also be established to ensure that patients in different regions benefit. These measures are crucial for rapid advancement in pain management.

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Disclosure

The authors declare that they have no conflicts of interest in this communication.

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