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Focus groups in the metaverse: shared virtual spaces for patients, clinicians, and researchers

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Patient focus groups can be invaluable for facilitating user-centered design of medical devices and new technologies, effectively capturing the richness and depth of patient experiences to help thoroughly assess feasibility, tolerance, and usability. While the metaverse holds promise for healthcare applications, its use in patient focus groups remains unexplored. In this Perspective we discuss the potential of the metaverse for conducting focus groups with patients. The theme of the focus group was the design and development of a therapeutic virtual reality application for patients with chronic low back pain. We carried out a pilot study comparing a focus group in a shared virtual space *versus* a physical location. This experience was positively received by patients, researchers, and clinicians, suggesting the metaverse is a viable medium for conducting these meetings and has potential advantages for remotely located participants, opening the doors for future expansion beyond focus groups to encompass all kinds of patient support and information groups. This approach fosters patient-centered healthcare by helping to facilitate patient voices directly into the design process, which may help lead to improved healthcare delivery, patient satisfaction, and treatment outcomes.

KEYWORDS

metaverse, virtual reality, applications, focus groups, shared spaces, clinical VR, embodiment

Introduction

The metaverse is envisioned as a consistent virtual environment and shared space where people can interact and collaborate in real time while represented by avatars (Mystakidis, 2022; Shoa et al., 2023). These avatars can be customized to the users' real aspect but can also allow other representations. While the metaverse as a space where different systems seamlessly interoperate is not yet a reality, current shared virtual spaces can provide the experience of being with others and are an experimental space for investigating different aspects of virtual social interactions such as rules, feelings, emotions, behaviours, or restrictions (Schroeder, 2001; Giannopoulos et al., 2008; Gottschalk, 2010; Pan et al., 2012; Pan and Hamilton, 2018).

FIGURE 1
Patients, clinicians, developers and researchers in a shared space in immersive VR United during a focus group.

The healthcare landscape is undergoing a digital revolution, with advances in technology continuously reshaping how patients interact with the medical community. Patient engagement in the co-design of studies, medical devices, and intervention strategies has emerged as a critical aspect of modern healthcare (Mummah et al., 2016). This paper explores the potential applications of the metaverse for conducting meetings with patients, in particular focus groups, examining its potential benefits and addressing any existing challenges. We do that based on our own experience using a custom shared virtual space called VR United (Oliva et al., 2023). VR United is a virtual reality application aimed at supporting multiple people interacting simultaneously in the same virtual environment. Each participant is represented by an avatar, facilitating collective virtual experiences. We used VR United to conduct a focus group with patients in the context of the creation of a therapeutic virtual rehabilitation program for people with low back pain. We take this as a departing point in this Perspective so that we can discuss the potential of the metaverse for conducting focus groups with patients and in a wider sense, for meetings of researchers and clinicians with patients, or for peer-to-peer networking.

The need for patient focus groups in the design of digital technologies

Within the context of evidence-based design of medical devices and digital technologies, it is critical to work closely with patients throughout design and development, for developing solutions that are not only technically innovative but also feasible, acceptable, and tolerable for the intended users (Birckhead et al., 2019). Focus groups provide an interactive space in which optimal use can be made of participants' shared experiences and wide-ranging perspectives. The power dynamic is somewhat different to traditional one-to-one interviews or surveys, in that researchers have less control over the dialogue that unfolds and make themselves open to challenge by participants (Wilkinson, 1999). Focus groups must be well planned, carefully managed, and sensitively mediated to ensure inclusion and fully enable supportive discussion that includes everyone present (Nind et al., 2022), but if run well they can offer unique insights that might not be readily apparent to engineers, designers, or even healthcare professionals (Leung and Savithiri, 2009; Dil et al., 2024), providing wider perspectives than traditional interviews. This approach ensures that the development of medical devices is not only technically viable but also aligned with the actual needs, preferences, and experiences of the end-users—the patients.

Patients can identify potential safety issues or risks associated with the use of the device that might not be evident in laboratory settings or through theoretical analysis. Understanding how devices will be used in real-world settings helps in designing products that maintain their efficacy outside of controlled environments, thereby reducing the likelihood of misuse or errors. Devices designed with input from patients are more likely to be embraced and used correctly, gaining faster acceptance and market penetration, and thus benefiting both the manufacturer and the healthcare community (Garmer et al., 2004; Bevan Jones et al., 2020; Vandekerckhove et al., 2020; Quintero, 2022). Furthermore, ensuring that devices address clinically relevant issues as identified by patients helps in aligning product development with healthcare priorities and outcomes.

Focus groups in the metaverse

There are some considerable potential advantages to conducting focus group meetings in shared virtual settings. While initial setup costs for VR equipment and software may be significant, virtual meetings can ultimately lead to cost savings by reducing the need for in-person appointments, travel expenses, and associated overhead costs for healthcare facilities (Charles, 2000). Since patients with chronic pain often have reduced mobility, allowing them to attend a meeting from home may be beneficial, and unlike other forms of videoconferencing, in immersive VR the user has a strong sense of presence and *really being there* with other people in the shared environment (Schroeder et al., 2001). In addition, the novelty of VR can provide a heightened engagement, and a potential distraction effect from pain, potentially leading to increased levels of interest and participation in the shared discussion (Matamala-Gomez et al., 2019; Coban et al., 2022).

There may also be some drawbacks or disadvantages. Technical glitches such as hardware malfunction, software bugs or poor internet connection speed, poor usability or discomfort/cybersickness using VR headsets could hinder the meeting for some patients, particularly so with longer meetings. There is also the potential for misinterpretation or miscommunication (Akselrad et al., 2023). While the virtual avatars have mouth animations triggered by the microphone in the HMD, and full upper body and head tracking providing visuomotor congruence with real life movements, other more subtle forms of non-verbal communication such as facial expression and eye gaze are currently not captured (although this is likely to change in future iterations thanks to recent technological advances in VR hardware). Additionally, the security and privacy of patient data within VR platforms would need to be carefully addressed.

To explore some of these issues, we conducted a pilot study with patients with chronic low back pain that had been independently testing a virtual reality rehabilitation program at home for 5 days. The program consisted of a set of therapeutic experiences, games and exercises designed for the rehabilitation of the low back pain, a development within the project “XR-PAIN: eXtended Reality-Assisted Therapy for Chronic Pain Management” (see Funding section). The system is based on embodiment of virtual bodies (Slater et al., 2009; Sanchez-Vives et al., 2010; Blanke, 2012; Maselli and Slater, 2013) and realization of a variety of therapeutic strategies including education/reassurance, gamification, graded exercise, and relaxation, in order to reduce pain and disability and improve range of motion and movement confidence (Matamala-Gomez et al., 2019; Donegan et al., 2022; Álvarez de la Campa Crespo et al., 2023). Four volunteer low-back pain patients were given a VR system (Quest 3, Meta, California) with the program installed. They were instructed to use the program at home for 20 min daily for 1 week in order to pilot test the VR system and the rehabilitation program contents. These patients also agreed to provide a front-facing photograph to have a customized avatar made for when they attended the virtual focus group.

We organized a focus group session in a shared virtual space using VR United with four patients, one clinician (traumatologist), two physiotherapists, two developers and three researchers (Figure 1). A structured session was organized, where in a highly interactive dialogue guided by the researchers, the patients actively reported on their experience with the rehabilitation program, content relevance and appropriateness of the contents, user experience, effectiveness, or suggestions for improvement. They also commented on different aspects of the contents, such as their experience with different games and exercises.

In a physical focus group meeting with the patients conducted 3 days after the virtual focus group meeting, the patients reported on their experience of the virtual focus group. They valued being able to be at their own homes without the time and physical effort of travelling. They found it comforting to know that they could meet in a common space. They also found it “weird the first 2 minutes and then it’s like a normal meeting.” They found the interaction between participants to be “very natural.” The experience was found to be less stressful and less intimidating than videoconferences, given that one does not need to prepare the environment nor their personal appearance, since the space is virtual and an avatar is used. Curiously, they also saw it as an advantage that the avatar does not show the use’s real emotions. No serious adverse effects were reported after an 80 min meeting, but one of the users found that by the end the head-mounted display felt heavy. Additionally, another patient, using the program at home alone, was momentarily startled when she launched the application and a male attendee suddenly appeared seated next to her. Such experiences highlight the very realistic sense of presence of really being there in the virtual space with other people, as well as the need to account for the potential vulnerability and comfort of users.

Participants also made new suggestions, like having the name of each person by the avatar since after a round of introductions one normally forgets the names of people at the meeting, a clear demand for augmented virtual reality. Interestingly, in a physical meeting after the experience, users had the impression that they had been together previously, they knew and recognized each other not only by their physical aspect but also by their voices and body movements.

A look into the future

The potential applications of the metaverse in healthcare and medical training and practice are numerous. Several recent reviews and surveys have addressed this topic (Bansal et al., 2022; Usmani et al., 2022; Yang et al., 2022; Ahuja et al., 2023; Suh et al., 2023; Ullah et al., 2023), and there are a number of studies exploring the therapeutic potential of virtual reality in a group setting (Tamplin et al., 2020; Dilgul et al., 2021; Ong et al., 2022; Lai et al., 2023). However, none of these studies feature full embodiment of realistic virtual avatars in shared virtual spaces, and the potential use for patient focus groups has not yet been discussed. Incorporating patient focus groups into the design and development of health technologies is crucial for developing solutions that are not only technically innovative but also highly relevant, safe, and effective for the intended users. This approach enhances the quality of healthcare delivery, patient satisfaction, and overall treatment outcomes, marking a significant shift towards more patient-centred healthcare solutions. Our early pilot studies comparing this experience in a shared virtual space *versus* a physical space have been positively valued by patients, researchers, and clinicians. This opens the door to future expansion, not only for focus groups but also for different types of support and information groups, both between patients themselves and with healthcare practitioners.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies using VR involving humans were approved by the Hospital Clinic de Barcelona CEIm. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

BAA: Investigation, Writing–review and editing. TD: Investigation, Writing–review and editing. IC: Software, Investigation, Writing–review and editing. JS: Investigation, Writing–review and editing. ER: Software, Writing–review and editing. CV-R: Resources, Investigation, Writing–review and editing. AC: Resources, Investigation, Writing–review and editing. RO: Methodology, Investigation, Writing–review and editing. MVSV: Conceptualization, Funding acquisition, Investigation, Supervision, Writing–original draft, Writing–review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

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