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# Editorial: Mixed reality in palliative care

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## KEYWORDS

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## Editorial on the Research Topic Mixed reality in palliative care

Patients in palliative care are often socially isolated from family and friends in their final weeks and months of life as a result of weakness and physical deterioration, a situation which has been exacerbated by strict COVID-19 social distancing measures. These circumstances often leave patients in states of psychological, emotional and spiritual distress before death, which also increases their experience of physical pain. Recent research on care for advanced cancer patients identifies a lack of adequate psychological support as an underdeveloped area, seriously affecting the wellbeing of patients during their end-of-life experience. Innovative interventions minimizing the detrimental psychological impact of physical isolation are therefore of pressing demand. Palliative care plays an essential role in these circumstances, providing holistic care which aims to manage physical symptoms while also addressing the underlying psychological and emotional needs of the patient using various therapeutic methods to help them “prepare for death and affirm the patient as a human with a unique life” (Keall et al., 2014). In this respect, the Metaverse and Virtual and Augmented Reality technologies offer novel and unprecedented opportunities for the fulfilment of palliative care patients unmet psychological and physical needs at the same time as facilitating remote communication with family and friends with a greater sense of presence and immersion. This Research Topic on Mixed Reality in Palliative Care introduces research on the development of novel Virtual Reality (VR) and Augmented Reality (AR) systems used to improve the wellbeing of patients in palliative care. As with the introduction of any novel technology, user experience is of paramount importance and technical considerations are directly related to the affective states they produce. Therefore, this Research Topic covers a number of relevant areas of research including accessibility, ethics, socio-cultural concerns and medical considerations.

In this Research Topic, Woo et al.’s paper “*Flourishing-Life-Of-Wish Virtual Reality Relaxation Therapy (FLOW-VRT-Relaxation) outperforms traditional relaxation therapy in palliative care: results from a randomized controlled trial*” reveals significant decreases in pain scores for patients in palliative care who are treated with a novel VR-based therapeutic intervention which allows users to experience various relaxing 360° environments. This ground breaking and scientifically rigorous study conducted on 126 patients in the Hong Kong hospital system is the first of its kind to demonstrate the positive effects of virtual reality therapies (VRT) for patients in palliative care. Niki et al.’s study “*A real-time virtual outing using virtual reality for a hospitalized terminal cancer patient who has difficulty going out: a case report*” presents a new approach using VR to allow patients to experience virtual outings in real-time. This method, which has become feasible due to advancements in high-speed, low-latency communication systems, was tested on a male patient in his early 70s. The patient and his family were able to converse smoothly without time lag in the VR space, enhancing the

patient's sense of presence. Following the VR session, improvements were noted in the patient's tiredness, drowsiness, depression, and overall wellbeing, with increases in pleasure and satisfaction. No side effects or symptom worsening were observed. This suggests that real-time virtual outings using VR could fulfil the desires of hospitalized terminal cancer patients who have difficulty going outside. In Glowacki's paper "VR models of death and psychedelics: an aesthetic paradigm for design beyond day-to-day phenomenology," the author presents a novel theoretical framework for understanding the relationship between aesthetic representation in VR and the visual phenomenology of near-death-experiences (NDE's). The paper discusses the potential of virtual reality experiences (VREs) designed under the "numadelic" aesthetic, a concept that represents bodies as energy rather than physical entities. This aesthetic is inspired by near-death and psychedelic experiences, which are known to reduce death-related anxiety and offer non-ordinary insights. The numadelic aesthetic, characterized by low structural specificity and symbolic rigidity, offers an expansive space for users to project meaning and generate insights, similar to the high-entropy brain states observed during near-death and psychedelic experiences. This theoretical framework helps to explain the observed results from previous studies using numadelic aesthetics in VREs and suggests potential experimental tests. It also provides a foundation for using numadelic aesthetics to model near-death experiences and address death-related anxiety. Ng et al.'s paper "Participatory design of a virtual reality life review therapy system for palliative care" presents the qualitative results of a new VR-based life review therapy systems for patients in palliative care designed in collaboration with clinical psychologists working in palliative care in the Hong Kong hospital system. The intended goal of this systems is to aid patients to reflect on their life experiences and come to terms with their own mortality. Designed in response to mobility restrictions and pandemic-related isolation, this system offers customized virtual spaces for therapy sessions. The design and evaluation of the system involved six clinical psychologists experienced in delivering life review therapy in Hong Kong hospitals. Feedback from these professionals on aspects such as avatars, content design, haptics, interaction, and soundtracks, among others, were incorporated into the system's final design. The system was seen as feasible and effective for palliative care patients, while requiring improvements in movement and interaction features.

## References

Keall, R., Clayton, J. M., and Butow, P. (2014). How do Australian palliative care nurses address existential and spiritual concerns? Facilitators, barriers and strategies. *J. Clin. Nurs.* 23 (21-22), 3197–3205. doi:10.1111/jocn.12566

The papers collected in the Research Topic address a number of critical issues in this new and emerging field which will benefit VR developers, HCI researchers, therapists and ultimately, improve the psychological wellbeing of patients in the final stage of their lives.

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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.

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