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Need for a 'VR-cebo' and more robust evaluations of virtual reality intervention

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In this issue of *BMJ Oncology*, Moon *et al*[1] discuss the findings from their recent study that explored the possible benefits of virtual reality in an oncology and palliative care setting. The 'Godfrey project' (so called after a Cornish lighthouse which is a well-known local landmark) used personalised virtual reality experiences to determine whether virtual reality can offer therapeutic benefit and hope during challenging times.

The headset used was one that is commercially available (PICO Neo 3 Pro 5.7K) with some over-ear headphones. The content, operated via a tablet by the researcher, was developed by the authors and included experiences of boat trips, kayaking and landscapes across places such as Cornwall and Isle of Scilly. Participants had no time limit when using the virtual reality equipment and could view as many scenarios as they wished.

Over a 7-month period, 60 adults from a large general hospital (either as an inpatient or from the chemotherapy unit) participated in the study. Participants were asked to complete a questionnaire (the Edmonton Symptom Assessment System Revised, ESAS-r) about their physical (pain, tiredness, drowsiness, nausea, appetite, breathlessness) and psychological (depression, anxiety, well-being) health before and after the virtual reality experience. The authors reported that virtual reality helped to significantly improve the physical and psychological health of the participants.

The promise of virtual reality in the 1990s[2] did not match the available software capabilities. Fast forward almost 30 years, and virtual reality technology has seen significant investment from technology giants such as Google, Samsung and Meta. This has meant that the technology has become more portable, more powerful, more affordable and more accessible. These changes, alongside a pandemic where there was the opportunity to witness how much technology could support healthcare systems, has led to a greater interest regarding the potential therapeutic benefits of virtual and augmented reality for people living with an incurable illness.

There have been numerous other studies employing similar methodologies to Moon *et al*: a single-site, single group, pre–post design: with a cohort of patients using a virtual reality headset reporting how they feel, before and after.[3–6] These studies all report a noticeable reduction in symptomatology, and as Moon *et al* point out, virtual reality offered patients the choice to use a non-pharmacological treatment that they could fully control. However, these studies share the same methodological weaknesses. A single use of virtual reality with no comparator group means that it is difficult to disentangle whether the results are simply a gimmick effect (from doing something new) or if there is any sustained benefit from the virtual reality. Guenther *et al*[4] did include a follow-up and reported that the reduction in pain was sustained 1 hour after use of virtual technology. Moscato *et al*[6] investigated the effectiveness of virtual reality over multiple uses (4 days). They reported that there was no difference in anxiety, depression, or pain between day 1 and day 4.

Evidence from individual studies has been synthesised within multiple systematic reviews.[7–10] The conclusions from all the reviews call for the same future directions:

First, a virtual reality intervention needs to be better defined and clarified. There is currently little agreed process to the

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content, duration and frequency, or the 'dosage' of virtual reality. The lack of clarity in the intervention makes developing any meaningful clinical guidelines difficult. It also limits the comparison of future research studies.

Second, more robust methodologies are needed. The current evidence is based on feasibility and pilot studies and often conclude with the phrase 'more research needed'. To realise the possible benefits of a virtual reality as a therapeutic intervention, better methodologies are vital. Virtual reality offers the potential for individualised care, where the individual can tailor their use of the intervention to suit their needs. It can empower them to take control of their symptoms (eg, pain management, or anticipatory symptoms).[11] Without more robust trial designs, it is impossible to provide recommendations and to understand how and where virtual reality offers the most benefit.

We would add a third point to the review evidence, which is the need of defining a virtual reality placebo intervention. This has not been done yet, and it is quite a challenging proposition. What would a placebo virtual reality intervention consist of? Should it, for instance, take you into a neutral grey room, perhaps with has a standard white dot to focus on, perhaps with some noise cancelling headphones. Even this could be critiqued, but it will be essential to have a proposed, standardised 'VR-cebo' in the future, if a research team wish to prove that their virtual reality intervention (eg, a deep-sea dive with whale song playing in the background) is the most effective one for pain relief, in a double-blinded randomised controlled way.

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