

# Virtual reality for the improvement of simulation performance and education resources – VISPER trial

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## Background

Virtual reality (VR) as an educational tool has seen a sudden rise in recent years. The development of VR hardware and software has seen developments in realism and audiovisual systems thus making it useful as an immersive simulated experience. The use of this technology creates an opportunity to conduct simulation with reduced costs, lower staff requirements and a high level of realism in comparison to the high-fidelity simulation that is currently used for the education of medical students. We aimed to determine the utility of VR, when used in conjunction with simulation, to increase familiarisation with the topic, improve the performance in high-fidelity simulation and increase retention of technical and non-technical skills. Informed written consent was ensured prior to study recruitment. The study's estimated time frame is from September 2022 to April 2023.

## Study objective

Our novel aim is to determine if the use of VR, in conjunction with simulation, improves the performance in high-fidelity simulation.

## Study design and methodology

Final year medical students based at Russells Hall Hospital, Dudley were recruited and consented. Meta Quest 2 VR headsets will be used in conjunction with Oxford Medical Simulation (OMS) software platform. This is a validated VR simulation experience.<sup>1</sup> For every topic, participants were allocated to a control or VR arm. The control participants were exposed to a lecture followed by a related simulation scenario. The intervention arm completed the lecture, a VR simulation and then the corresponding simulation scenario. Two topics have been measured to date: seizure and acute confusional state.

Primary outcomes: We used the validated Behavioural Markers System (BMS)<sup>2</sup> to assess non-technical skills. Technical skill in scenarios will be measured according to time taken to perform critical actions. Secondary outcomes: Participants will complete questionnaires to assess prior experience, immersion level and self-reported confidence at the specified scenarios.<sup>3</sup> Questionnaires will be performed before the lecture and after the final simulation.

## Results

Mann-Whitney U tests demonstrated a significant improvement in the BMS scores for participants in the intervention arm for gathering information ( $p = 0.040$ ), and recognising and understanding information ( $p = 0.032$ ). During the scenario, the VR arm groups completed 6% more critical actions and completed these actions 28.6% quicker.

## Conclusion

Given the significant positive changes noted with the incorporation of VR as an adjunct to simulation from the data collected so far, we plan to continue data collection for further scenarios. We hope to transform the scope of medical education through the incorporation of VR as a novel adjunct for medical student and junior doctor simulation training. ■

## References

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