697 The Use of Augmented and Mixed Reality Technology to Improve Surgical Outcomes: A Systematic Review

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Aim: The use of augmented and mixed reality technology is a novel and rapidly developing field. This technology has generated significant interest in surgery, however the evidence supporting its proposed benefits is limited. This systematic review aims to critically appraise the intraoperative use of augmented and mixed reality technology to improve surgical outcomes in order to provide directions for future research.

Method: This systematic review is registered with PROSPERO (CRD42020205892) and was performed in adherence to PRISMA guidelines. Studies reporting primary data on surgical outcomes of the intraoperative use of augmented and mixed reality technology were included. A structured search of major literature databases was performed. Risk of bias was assessed following the guidance of the Cochrane Handbook.

Results: 68 studies met the inclusion criteria, with 63 reporting the intraoperative use of augmented reality technology and 5 reporting the use of mixed reality. The number and methodological quality of these studies is increasing. The intraoperative use of this technology has been demonstrated to reduce operative times, intraoperative blood loss and lengths of hospital admissions in specific settings. The widespread adoption of this technology faces the challenges of its cost, technical precision and integration into the surgical workflow.

Conclusions: The intraoperative use of augmented and mixed reality technology is an area of research still in its early stages, with an increasing number of methodologically robust studies on the subject. Current results suggest that the use of this technology is safe and, in certain applications, has the potential to significantly improve surgical and health-economic outcomes.