A Scoping review of effects of simulation on surgical skills and confidence of Ophthalmology trainees performing Glaucoma, Oculoplastic and Orbital procedures

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Introduction

There has been a shift towards simulation based training as opposed to the historical apprenticeship model of medical training. The need for alternative training models has been highlighted particularly in recent times due to restrictions in the working patterns, reduced clinical opportunities and ethical concerns of trainees learning surgical procedures on patients.

Simulation based training can provide a structured, controlled learning environment whilst not putting patients at risk. Having a standardised training format which is reproducible, cost effective and has translational downstream effects of improvements in patient care or cost savings would provide a solution to the current problem.

Methods

This was a scoping review of the literature using Medline and EMBASE databases as well as hand searching the literature. The Medical Education Research Study Quality Instrument (MERSQI) was used to measure the quality of the studies, with this instrument providing a score for the validity of the evaluation instrument used. In order to assess the educational impact of simulation based learning, levels of simulation based translational outcomes proposed by McGaghie et al. proposed were used. The data was analysed in a qualitative manner.

Aim

The aim of this scoping review is to assess the effects of simulation based training on surgical skills and confidence of Ophthalmology trainees within the Ophthalmic sub-specialities of Glaucoma, Oculoplastic and Orbital surgery (GOO).

Results

- Twelve studies were included for qualitative data synthesis.
- See Figure 1 for range of simulation tasks reported

Simulation based training has high levels of internal acceptability with subjective reports from the participants being **overwhelmingly positive in its ability to improve confidence in performing surgical procedures related to GOO.**

Results suggest that there are some improvements in surgical skills such as reduction in time taken to perform the procedure and also improvement in objective skills assessment scores. There is a suggestion that this improvement could be maintained for up to one year.

In terms of translational outcomes according to McGaghie et al the highest level was 2, defined as **contained effects** shown as changes in performance in the simulation context.

One randomised control trial by Dean et al. (2021) showed that the intervention group which received simulation training was 20 times more likely to perform trabeculectomy surgery (the procedure they received simulation training on) compared to the control group. However, they do not report any improvements in patient outcomes in this group.

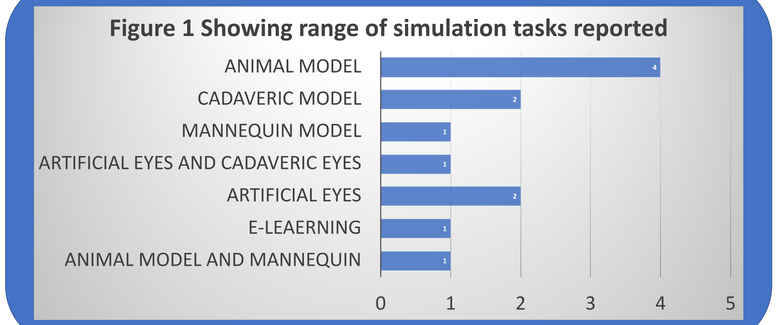
Conclusion

In conclusion, simulation based training greatly improves the confidence of Ophthalmology trainees in performing surgical procedures related to GOO. Evidence of its effects on downstream processes such as improvement in patient outcomes and cost saving is still lacking, therefore, more studies with validated instruments assessing outcomes are needed.

Strengths

This study used a validated tool to assess the quality of the included studies
In addition, we investigated an area which is emerging in the literature i.e. simulation within GOO sub-specialities.

Figure 1 Showing range of simulation tasks reported



McGaghie WC, Issenberg SB, Barsuk JH, Wayne DB. A critical review of simulation-based mastery learning with translational outcomes. Med Educ. 2014;48:375–85.