

Pilot Study: Acceptability and Effectiveness of EyeSi Direct Ophthalmoscopy Simulator in Undergraduates' Clinical Skills

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INTRODUCTION

Direct ophthalmoscopy is an essential clinical skill, yet competency among non-ophthalmologists varies.

Teaching is challenged by limited realism of eye models and restricted opportunities to practise on real patients.

The Haag-Streit EyeSi Direct Ophthalmoscopy Simulator offers structured training through virtuality and real-time feedback.

In this pilot study, we evaluated the simulator against the first two levels of Kirkpatrick's evaluation criteria – reaction and learning.

AIM

To evaluate the EyeSi simulator's **acceptability (Level 1)** and its impact on **confidence and knowledge (Level 2)** compared to traditional teaching

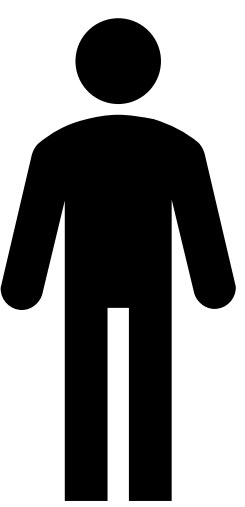
CONCLUSION



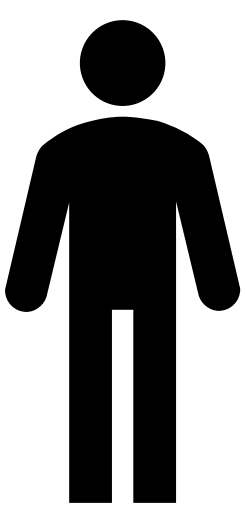
METHODS

Final-year medical students
One-week clinical rotation in Ophthalmology
Non-randomised convenience cohorts

Practice under
minimal supervision
with EyeSi simulator



SIM
(n=35)



NO-SIM
(n=32)

Traditional small-group
teaching with direct
demonstration and peer
practice



PRE- AND POST-INTERVENTION QUESTIONNAIRES

ACCEPTABILITY (LEVEL 1)

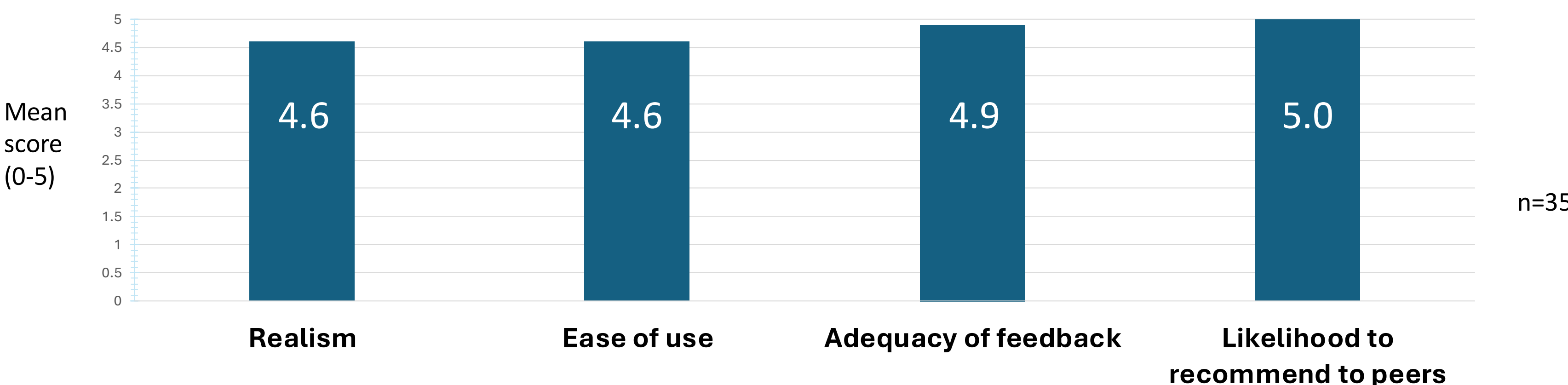
- **Likert-scale ratings** (realism, ease of use, adequacy of feedback)
- **Open-ended questions** (advantages and suggestions for improvement)

CONFIDENCE & KNOWLEDGE (LEVEL 2)

- **5-point Likert-scale ratings on confidence** (technique, recognition of retinal structures and pathologies)
- **MCQ-based knowledge test** (same categories)
- **Within- and between-group change (SIM vs NO-SIM)** in confidence and knowledge
- **Statistical analysis: Paired (pre–post) and independent (SIM vs NO-SIM) t-tests**, with significance set at $p < 0.05$

RESULTS

ACCEPTABILITY (LEVEL 1):



Qualitative findings:

Biggest perceived advantage = practising on a wide range of pathologies (n=14).

Also:

- **fun, realistic and easy-to-use** (n=6)
- **scaffolded learning** (n=4)
- **real-time feedback** (n=3)
- **stress-free practice** (n=2)
- **shared learning via side-screen** (n=1)

Paired teaching with subsequent practice on real eyes was recommended (n=5), which was the **biggest perceived advantage of traditional teaching** (n=14).

CONFIDENCE & KNOWLEDGE (LEVEL 2):

Key findings:

SIM participants (n=35):

- Greater improvement in **confidence identifying retinal pathologies** ($\Delta +1.94$ vs $+1.15$, $p=0.001$, $d=0.81$)
- Greater improvement in **confidence examining the retina** ($\Delta +2.30$ vs $+1.81$, $p=0.045$, $d=0.50$)
- Higher **knowledge scores for retinal pathology identification** ($\Delta +1.80$ vs $+1.03$, $p=0.022$, $d=0.57$)

The Haag-Streit EyeSi Direct Ophthalmoscopy Simulator was highly acceptable and improved confidence and knowledge, particularly in recognising retinal pathology. As a pilot study with non-randomised cohorts, findings should be interpreted cautiously. We encourage larger, longitudinal studies assessing all four levels of Kirkpatrick's criteria – reaction, learning, behaviour, results – to determine real-world performance.