Simulation Training in the Adult Major Haemorrhage Protocol

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Introduction

Excessive blood loss is common and can jeopardise the survival of adult patients in many clinical settings[1]. Moreover, deleterious outcomes in major haemorrhage can also be attributable to failings in healthcare processes, as highlighted by the National Patient Safety Agency (NPSA)[2].

The early recognition of significant blood loss and the initiation of effective actions are therefore vital[2]. One such solution is activation of an Adult Major Haemorrhage (AMH) protocol, which triggers a coordinated chain of events and leads to the rapid release of blood and blood components. Its success however also relies upon efficient communication, effective teamwork and thorough knowledge of the protocol[2,3].

The aims of this study were to determine if high-fidelity AMH simulation training increases healthcare professionals' knowledge of and confidence in using the Oxford University Hospitals (OUH) NHS Trust's AMH protocol[4].

Methods

Study design and participants
Prospective cohort study undertaken between March-May 2014 involving Foundation Year 1 (FY1) doctors in the OUH NHS Trust.

Study procedures
Eligible participants were recruited to either the intervention (undertakes AMH simulation training) or control (does not undertake AMH simulation training) group. For the study duration, the control group were exposed to AMH only through their normal clinical practice, whereas the intervention group received (in addition to their normal clinical practice) a full-day simulation training session which included lectures on the AMH protocol, human factors and communication skills. Simulation training took place at the 'Oxford Simulation, Teaching and Research' (OxSTaR) centre[5].

All participants completed a questionnaire to assess their knowledge of and confidence in using the AMH protocol both 1 month before and 1 month after the date of simulation training (referred to as the 'pre-simulation' and 'post-simulation' questionnaires respectively).

Statistical analyses
Data between intervention and control groups were compared using the Independent t-test and statistical significance was assumed at the $p < 0.05$ level.

Results

	Intervention (n=15)	Control (n=15)	p[a]
Age (Median, IQR[b])	25 [24-25.5]	25 [24-25]	1
Gender (M:F)	7:8	8:7	0.73
Higher degree (Yes:No)	2:13	3:12	0.52
Previous AMH training (Yes:No)	0:15	2:13	0.15
Number of clinical AMHs involved in between questionnaires	3	1	0.3

Table 1. Participant demographics and Adult Major Haemorrhage (AMH) experience. [a] Independent t-test. [b] IQR, Interquartile Range.
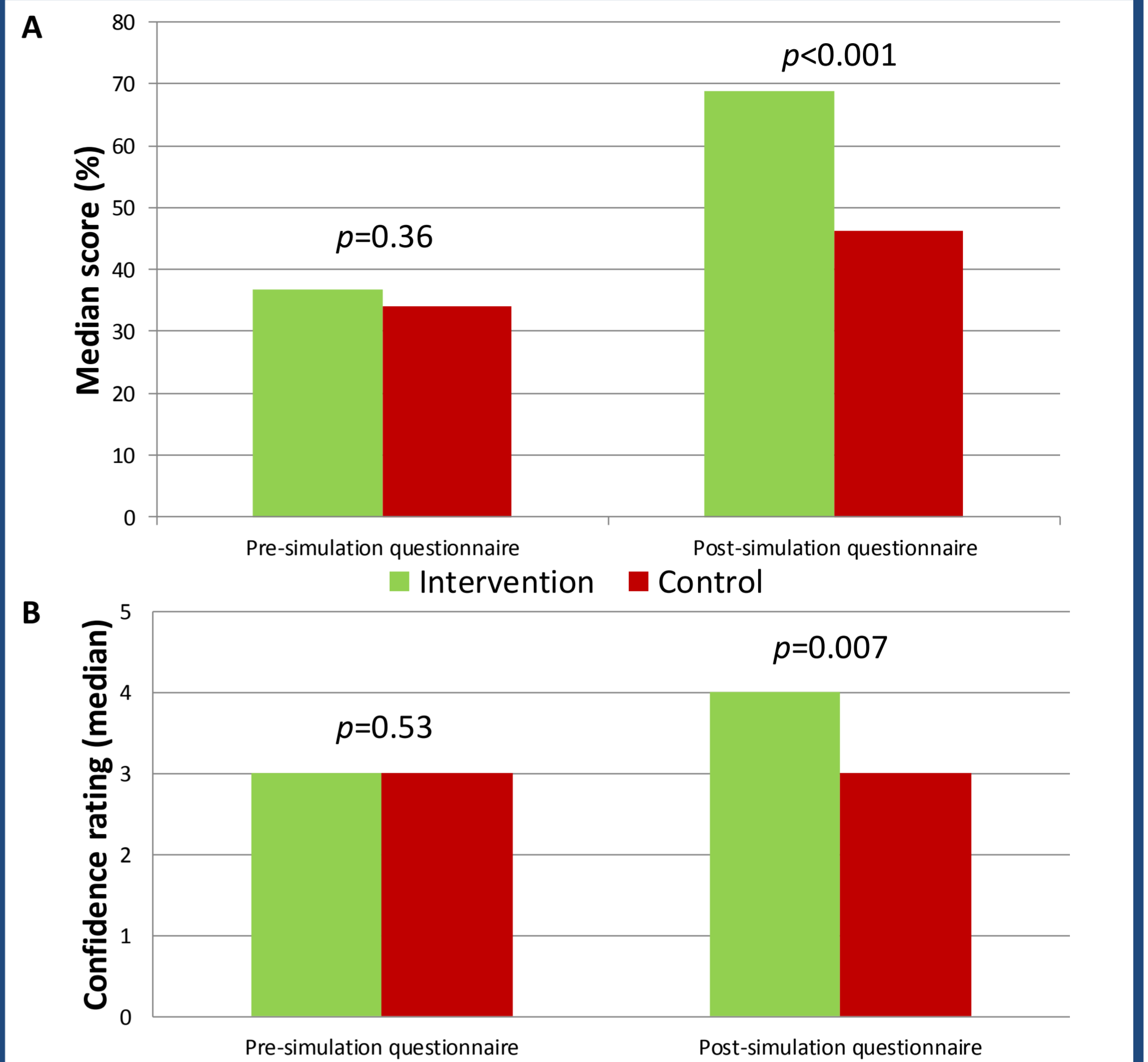
Figure 1. Comparisons between intervention and control groups. **A.** Pre- and post-simulation questionnaire median scores. **B.** Self-rated confidence in managing Adult Major Haemorrhage (AMH) before and after simulation training.

Conclusions

AMH is a significant cause of morbidity and mortality. This study has shown that high-fidelity one-day simulation training increases both the knowledge of and confidence in using the OUH NHS Trust's AMH protocol amongst FY1 doctors. Further studies are required to assess whether this benefit is seen amongst more senior trainees and also to determine whether the results translate into clinical practice by improving patient safety.

Feedback from the intervention group stated that simulation training is an effective method of teaching AMH management, and that the current AMH protocol is clear and easy to follow. However they highlighted that insufficient time is dedicated to major haemorrhage during FY1 teaching and that it should be incorporated into either induction or mandatory weekly teaching.

Acknowledgements

1. Reiss RF. Haemostatic defects in massive transfusion: rapid diagnosis and management. *Am J Crit Care*. 2000; 9: 158-165. **2.** *Rapid Response Report: The transfusion of blood and blood components in an emergency*. National Patient Safety Agency. Report number: 017, 2010. **3.** Pham HP, Shaz BH. Update on massive transfusion. *Brit J of Anaesthesia*. 2013; S1: i71-i82. **4.** Oxford University Hospitals NHS Trust. *Transfusion Management of Major Haemorrhage in Adults – version 6.0*. [Online]. Available from: http://ouh.oxnet.nhs.uk/Pages/Home.aspx [Accessed 12th March 2014]. **5.** University of Oxford. *Oxford Simulation, Teaching and Research (OxSTaR) centre*. [Online]. Available from: http://www.oxstar.ox.ac.uk [Accessed 31st December 2013].