

SHARP-Neuro: Evaluation of an Advanced Multidisciplinary Simulation Course for Safer Neurosurgical Practice

Dr Tamara Morley¹, Ms Emma Toman², Dr Umair Ansari³, Dr Claire Moody⁴, Mr Adam Murcott, Dr Rohit Mittal³, Dr Naginder Singh⁴

Introduction

Neurosurgery requires effective multidisciplinary teamwork, communication, and decision-making.

Limited opportunities for MDT simulation focused on the challenges in acute neurosurgical practice.

SHARP-Neuro aims to address these challenges.



Methods

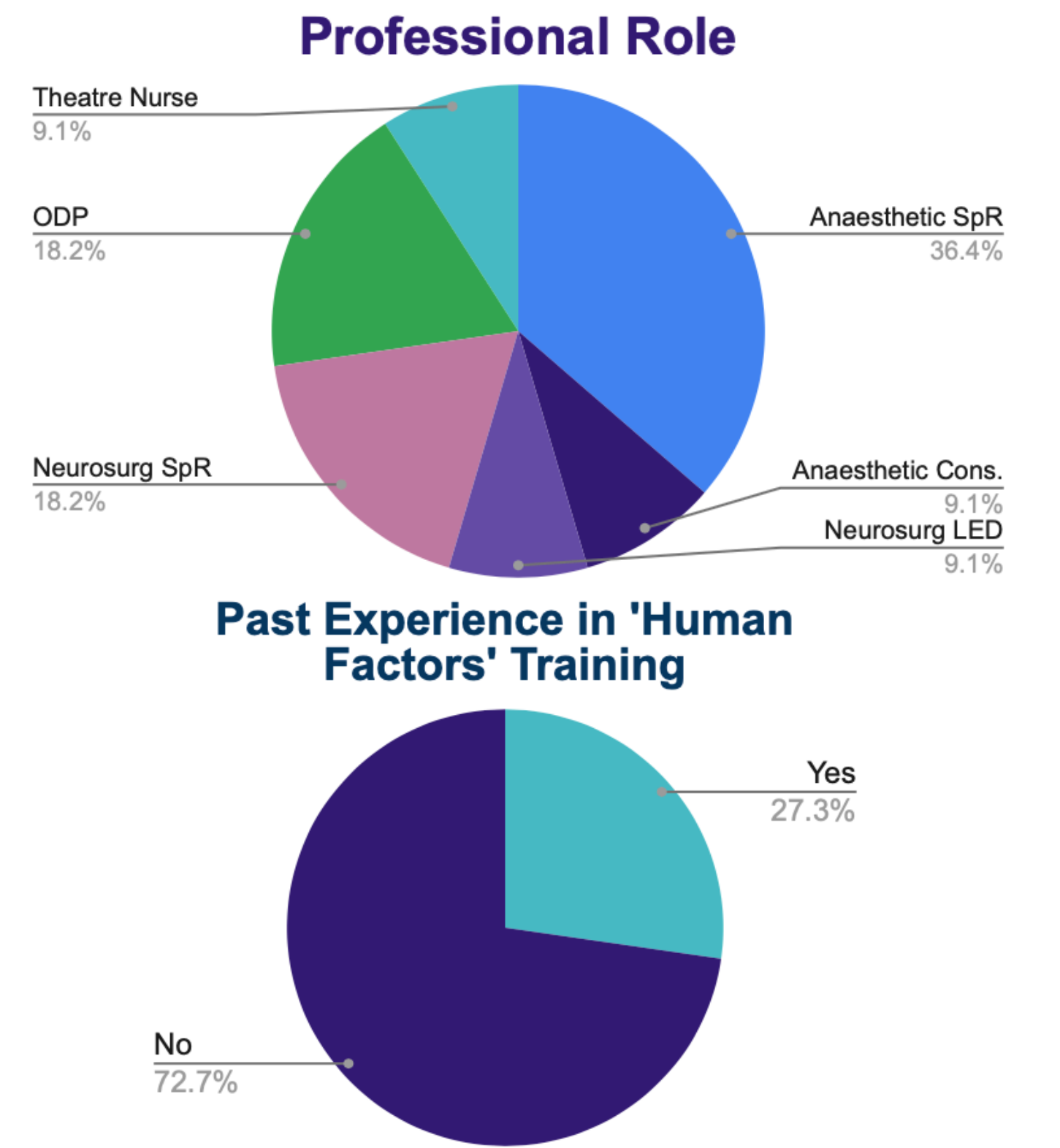
A proof-of-concept evaluation using Likert-rated items with 11 participants, with follow-up responses collected 4-10 days after the course, and matched to baseline. Item-level missing data meant 9-11 complete pairs, analysis used two-sided paired Wilcoxon signed-rank tests and was exploratory, without adjustment for multiple comparisons.

Results

Statistically significant outcomes:

Conclusion:

All participants rated course 8–10/10; 7/11 intended to change clinical practice.



Perceived preparedness (1-5)	Non-zero paired n	Pre-course median (IQR)	Post-course median (IQR)	W	P-value
Decision-making under time pressure	8	3.5 (3-4)	5 (4-5)	0	0.008
Coordinating MDT responses in crisis	8	3 (3-4)	5 (4-5)	0	0.008
Managing conflict within theatre teams	7	3.5 (2-4)	4 (4-4)	0	0.016
Managing a neurotrauma transfer	7	4 (3-4)	5 (4-5)	0	0.016
Applying human factors in emergency	6	4 (3-4)	4 (4-5)	0	0.031
Leading a post-event debrief	6	3.5 (3-4)	5 (3-5)	0	0.031
Perceived effectiveness (1-10)					
In a clinical emergency	7	8 (7-8)	9 (8-9)	0	0.016

- SHARP-Neuro was well received and associated with improved self-rated preparedness for human-factors challenges.
- Improved preparedness was reported for decision-making under pressure and coordinating multidisciplinary responses.
- Immersive simulation provided an opportunity to rehearse human-factors skills in time-critical high-pressure scenarios.
- Participants also reported improved preparedness for crisis leadership, communication and structured debriefing.
- These findings support multidisciplinary simulation as an adjunct to conventional neurosurgical education.
- Further evaluation should include larger cohorts, objective team-performance measures and long-term follow-up.

Implications for Education in the Neurosurgical MDT

Integrate MDT simulation

Prioritise non-technical skills

Embed human factors

Rehearse high-risk scenarios

Promote team-based learning

Rehearse crisis leadership and MDT coordination

Evaluate objective and long-term outcomes

Limitations: Small, heterogeneous sample; single-group pre–post design; and reliance on self-reported outcomes limit generalisability and conclusions about clinical performance. Single day intervention without long-term follow-up prevent assessment of long-term outcomes.

Acknowledgements: The authors would like to acknowledge the faculty and participants involved in the development and delivery of SHARP-Neuro, including colleagues from neurosurgery, neuroanaesthesia and aviation human-factors backgrounds.
Lead Author: Tamara Morley
Email Address: Tamara.Morley@uhs.nhs.uk

Affiliations: Southampton University Hospital NHS FT¹, Department of Neurosurgery, University Hospital North Midlands², Department of Anaesthesia, University Hospitals Coventry & Warwickshire³, Department of Anaesthesia, Queen Elizabeth Hospital Birmingham⁴