PATIENT SPECIFIC TRAINING: DEVELOPMENT OF A CT-BASED MIXED REALITY FIBREOPTIC INTUBATION SIMULATOR

David Wright[1], Xinhui Ma[2], William Atkin[2], Linjie Wang[2], Michael Fagan[2], Zoe Wellbelove[1]; *[1]Hull Institute of Learning and Simulation, Hull, United Kingdom, [2]The University of Hull, Hull, United Kingdom*

10.54531/QOJS8275

Background: Fibreoptic intubation training has traditionally been performed using real fibreoptic scopes and manikins or improvised airway 'boxes', recently progressing to virtual reality training devices [1]. The latter are populated with computer generated images, represented 2 dimensionally on screens without depth perception and fail to reproduce the natural variation. We aimed to address these issues by producing a simulator that utilises a real patient's anatomy, in a mixed reality platform, without the need for additional hardware.

Methods: Health Research Authority Ethics approval was obtained. A digital imaging and communications in medicine (DICOM) file from an anonymised CT scan of a patient's head and neck, was processed in Avizo data visualisation software. It was segmented into anatomical structures and 2 tissue densities (bone/cartilage and soft tissue). This was imported into the Unity game engine as a 3D model. A fibreoptic scope with functional eye piece, monitor (to display the virtual fibreoptic scope image) and reference plane were also modelled. These objects were placed into a scene using the Windows Mixed Reality Toolkit to allow component interaction and support the application to a Hololens 2 mixed reality headset. Azure anchors were used to site the simulation in a real-world location and allow consistent position between use sessions (Figure 1). The gesture recognition function of Hololens was used to enable grasping and manipulation of the fibreoptic scope controller and voice commands were also enable for key actions. Its use was piloted by the developing team.

Figure 1: Mixed reality fibreoptic intubation simulator, Hololens views

Figure 1: Mixed reality fibreoptic intubation simulator, Hololens views.

Results: Using a DICOM file creates a detailed an anatomically accurate image, though it lacks surface characteristics (texture/colour variation) that make features appear natural. The virtual monitor is an interesting psychological construct, being a virtual view from within a virtual world. However, this performed well, with sufficient frame rate and resolution to feel natural. The physics of a flexible scope proved challenging, so we modelled this as a rigid structure for proof of concept. We also noted that the inclusion of collision avoidance would increase usability and realism.

Conclusion: There is a deliverable workflow from CT scan to mixed reality training. If refined this could be used to prepare for airway management in specific patients e.g. airway cancer [2]. Automating the DICOM import process would give access to the wealth of clinical variation available through existing CT databases and support a broader/higher level training experience.

REFERENCES

1. Baker PA, Weller JM, Baker MJ, Hounsell GL, Scott J, Gardiner PJ, Thompson JM. Evaluating the ORSIM® simulator for assessment of anaesthetists' skills in flexible bronchoscopy: aspects of validity and reliability. Br J Anaesth. 2016;117 Suppl 1:i87-i91.
2. Ormandy D, Kolb B, Jayaram S, Burley O, Kyzas P, Vallance H, Vassiliou L. Difficult airways: a 3D printing study with virtual fibreoptic endoscopy. British Journal of Oral and Maxillofacial Surgery. 2021;59(2):e65–71.

PAEDIATRIC IN-SYNC – INTERPROFESSIONAL SIMULATION NURTURING COLLABORATION

Kathryn Sharp[1], Prashant Kumar[1], Alex Harper[1], Barry Johnstone[1], Fiona MacLeod[1], Kathleen Collins[1]; *[1]NHSGGC Department of Medical Education, Glasgow, United Kingdom*

10.54531/RAZB1122

Background: There is international agreement that undergraduate healthcare students should be prepared for practice by experiencing Interprofessional Education (IPE) [1]. As a result, in the last decade IPE has become established in the curriculum of undergraduate health and social care education. Simulation-Based Education (SBE) provides an immersive, authentic experience to explore teamwork for undergraduate healthcare students.

Methods: A paediatric SBE course was developed for undergraduate physiotherapy (PT), medical (M), and children specialty nursing students (CN) with intended learning outcomes focussed on teamwork. During the course, three participants (one from each discipline) worked collaboratively to address the needs of a simulated patient. One scenario focussed on recognition and management of an unwell child and the other scenario was discharge planning. Following the scenario, interprofessional faculty co-facilitated a structured debriefing using the Plus/Delta model. The course was evaluated using the 'Readiness for Interprofessional Learning Scale' (RIPLS) [2]. The RIPLS scale measures attitudes to learning with other professionals on a five-point Likert scale. In order to gather additional qualitative data, the RIPLS was adapted to include free text questions. Statistical analysis of the pre- and post-course RIPLS was conducted using SSPS and thematic analysis was used to analyse the free text comments. The qualitative analysis is reported here.

Findings: Thirty-three students have participated to date (12 PT, 13 M, 8 CN). The four subscales of RIPLS were used as a framework for the thematic analysis. Most of the students described valuing the collaboration and teamwork during

the course that enabled delivery of patient care 'practice working as a team in a safe environment'. Almost all student feedback suggested they benefited from the opportunity to work together to deepen their understanding of roles and responsibilities 'becoming aware of other professionals' assessments and job roles'. Many of the participants' feedback suggested they had positive professional identity, valuing sharing knowledge between the members of the interprofessional team to enable effective decision-making, 'working with other professions, sharing knowledge to make clinical decisions'. Students also described benefiting from working with an interprofessional peer group 'working with colleagues of the same level of other professions'.

Conclusion: Students developed their interprofessional working relationships and attitudes during this SBE course which was viewed as a positive learning experience. The literature often discusses challenges to implement interprofessional simulation [3]. This course has shown it is feasible to deliver interprofessional SBE to enhance team working.

REFERENCES

1. World Health Organisation. Framework for Action on Interprofessional Education and Collaborative Practice. Geneva: World Health Organisation; 2010
2. Parsells G, Bligh J. The Development of a Questionnaire to Assess the Readiness for Healthcare Students for Interprofessional Learning (RIPLS). Medical Education. 1999;33:95–100
3. Gough S, Hellaby M, Jones N, MacKinnon R. A review of Undergraduate Interprofessional Simulation-Based Education. Collegian. 2012;19(3):153–170.

CLINICAL FELLOWS: MORE OR LESS DESERVING OF SIMULATION-BASED EDUCATIONAL OPPORTUNITIES?

Harjinder Kainth[1], Karishma Mann[1], Philip Dainty[1], Richard Morse[1]; *[1]The Royal Wolverhampton NHS Trust, Wolverhampton, United Kingdom*

10.54531/JIXT9886

Background: International Medical Graduates (IMGs) are making up an increasing proportion of the medical workforce in secondary care [1,2]. One of the most popular routes to enter clinical practice in the United Kingdom is through Trust-based Clinical Fellow posts, particularly for those not yet working at Consultant level [2]. At the Royal Wolverhampton NHS Trust (RWT), Clinical Fellows now make up almost half of non-Consultant doctor positions, working alongside, and equivalent to, colleagues that are in traditional training positions. Doctors employed by Health Education England, have specific training pathways that are funded centrally [2]. Conversely, doctors in non-training positions, including Clinical Fellows, do not have access to the same level of structure and funding. This also applies to educational opportunities, including Simulation-Based Education. IMGs often join the National Health Service with a wealth of clinical knowledge, skills, and experience. However, a local learning needs analysis revealed that their biggest challenges lie around differences in healthcare systems and culture. These skills are essential components of non-technical skills, which, we would argue, are ideal to be addressed using a simulation-based approach.

Methods: The results of the learning needs analysis informed the development of a bespoke simulation-based course for Clinical Fellows at RWT. We discuss the challenges of developing and organising such a course, as well as the successes and learning points gained from a pilot course.

Results: A pilot course was delivered to three cohorts of Clinical Fellows. All 23 of the participating Clinical Fellows had undergone medical training outside of the United Kingdom. The course comprised a variety of workshops and simulation-based scenarios covering a range of non-technical skills. Pre- and post-course surveys demonstrated significant positive outcomes in all areas, including communication, respectful challenge, breaking bad news, and medical handover.

Conclusion: Simulation-based education provides a beneficial learning environment for Clinical Fellows. For a group whose biggest learning gap lies with non-technical skills, it can be argued that this cohort of doctors is likely to have a greater benefit from simulation-based education than colleagues that have worked and trained within the United Kingdom. It is envisaged that this data can enable the Clinical Fellow Programme Team to obtain funding for further simulation-based courses aimed at Clinical Fellows in all medical specialties, hence having a positive impact on patient care and safety across the Trust.

REFERENCES

1. Baker C. NHS staff from overseas: statistics. House of Commons Library; 2021
2. Jalal M, Bardhan KD, Sanders D, Illing J. Overseas doctors of the NHS: migration, transition, challenges and towards resolution. Future healthcare journal. 2019;6(1):76–81.

QUALITATIVE RESEARCH TO UNDERSTAND THE ATTITUDES OF UNDERGRADUATE PHARMACY STUDENTS TOWARDS A COMMUNICATION AND PROFESSIONALISM COURSE EMPLOYING A FOUR-YEAR COMPLEX SIMULATION ENVIRONMENT

Jonathan Ward[1]; *[1]University Of Birmingham, Birmingham, United Kingdom*

10.54531/WFYN4545

Background: Whilst simulated patient (SP) inclusion in Medicine communication training is well established [1], a review of parallel literature for undergraduate Pharmacy programmes showed such research as extremely limited. The novel nature of a Pharmacy communication course (UK university) required a more detailed appraisal than existing module evaluations offered, so a study of student attitudes towards the course was undertaken. On commencement of a new MPharm programme in 2013, pharmacy and specialist clinical communication staff collaborated to develop an ambitious communication and professionalism course utilising a longitudinal 4-year complex simulation. The course is designed to meet the General Pharmaceutical Council (GPhC) standards and address the need for pharmacists to, 'understand the complexities of patients' circumstances insofar as they are relevant to their medicines use or other behaviours relevant to personal health and wellbeing' [2]. During the course, SPs present a series of fictitious patient/family journeys lasting years enabling students to contemplate the role of pharmacists in the provision of continuity of care. Students are encouraged to consider appropriate professional identity development and acquisition of clinical communication abilities, while also investigating the perspectives of family members and healthcare team members involved in cases. The feasibility of sustaining an effective longitudinal SP programme has been