Implications for practice

1. 'Do no harm' remains paramount in medical education. The benefit to society must be weighed against the risks to the child and their best interests must be kept central in educational processes.
2. When planning teaching I will:
3. Run monthly simulation sessions consolidating weekly didactic teaching
4. Limit sessions to 1 hour
5. Recruit young people within the hospital to minimize school absence
6. Invite collaboration between SPs and students to create scenarios around self-identified learning needs while maintaining psychological safety, allowing for complexity and fidelity that would be impossible if written by faculty
7. Train SPs to feedback using 'I' statements
8. Collaborate with the Child and Adolescent Mental Health Team prior to mental health scenarios to consider training and debriefing
9. Keep the SPs voice central to the debrief and feedback

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152 A NARRATIVE REVIEW: PRIMARY RESEARCH IN SIMULATION-BASED EDUCATION USING EYE-TRACKING TECHNOLOGY

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Background: There has been a gradual increase in research using technology such as eye-tracking in medical education in simulation. Subsequently, the aim of this review is to examine primary research for simulation-based education using eye-tracking technology.

Method: The Strengthening of observational studies in epidemiology (STROBE) method was used to evaluate the reliability of the simulation and eye-tracking articles [1]. The search strategy included articles published between 2010 and 2021. Articles were searched using terms derived from McCormack et al. (2014). An electronic database search was performed in January 2021: CINAHL, Medline, SCOPUS, Web of Science, Science Direct and APA Psych INFO with 2,621 hits. The search strategy included the following Boolean terms; 'expert' AND 'visual' OR eye track* (eye tracking) AND simulat* (simulation or simulated) AND diagnos* (diagnose or diagnosis).

Findings: The key finding from this narrative review highlighted the use of eye-tracking technology as an objective assessment tool in simulation-based education [2]. The literature reinforced the use of algorithms (e.g. ABCDE approach) when assessing a patient. Furthermore, the different gaze patterns between novices and experts were identified. There are limited studies available in simulation-based education using eye-tracking technology. Furthermore, none of the studies has measured the development of gaze patterns in simulation using a longitudinal study with a repeated simulated scenario.

Implication for practice: Eye-tracking technology can pinpoint the exact areas the healthcare provider is gazing upon during a simulated scenario to help focus the debrief and highlight the gaze patterns. Encourage the use of algorithms when delivering simulation-based education.

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150 'A SAFE LEARNING ENVIRONMENT': SIMULATION-INDUCED STRESS LITERATURE REVIEW

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Background: Simulation-based education (SBE) is often celebrated as a safe learning environment, but this usually refers to the risk posed to patients, in this literature review the psychological safety for participants and the elements of SBE that generate or reduce stress are sought. Stress and learning have a complex relationship in adult learning; however, negative stress may inhibit memory formation and so the sustainable effect of SBE learning may be jeopardized by participants experiencing unnecessary stress during SBE. It is therefore important to identify the nature and trigger for stress in SBE to optimize this resource.

Method: Using the online database PubMed and the search terms (stress and anxiety) AND (Simulation) AND ((clinical education, medical education)) without limits on publication type or date, 20 articles were returned. A non-systematic review was undertaken. Articles that were designed to deliberately introduce stress into SMEs to gauge the effect on performance were excluded. Included studies analysed the type, characteristics and potential triggers of stress evoked through participation in SBE. 17 studies were retained.

Findings: No studies in the UK were returned, SBE participants were from undergraduate and post-graduate settings and there was a mixture of professional groups included with three studies looking at team-based SMEs. Study design and method varied with an observational study being the most common method. Only one looked at qualitative data from focus groups of SME participants. Nearly all studies recorded a physical marker of stress – heart rate, cortisol level or visible signs of stress such as shaking hands. Two studies looked at techniques to actively reduce stress within

the SBE activity; a mindfulness exercise before a task-based simulation and an introduction of a period of relaxation prior to debriefing. Faculty awareness of participant stress was measured objectively in only one study. SME design and equipment stressors were directly considered in two studies.
Implications for practice: There are limited dedicated studies addressing SBE-induced stress and how this can be modified; furthermore, a lack of research into faculty impact on stress hinders the opportunity to change. This was not a systematic literature review and so the findings are limited, but can help inform practitioners: (1) Repeated exposure and familiarity with SME reduce stress. (2) Designate roles that participants would be expected to undertake in real clinical scenarios. (3) Minimize distracting factors in the environment unless directly contributing to learning outcome. (4) Introducing a purposeful period of calm before debriefing may improve retention of learning outcomes.

182 SURGICAL SIMULATOR DESIGN, WHAT ARE EDUCATORS AND TRAINEES REQUIREMENTS?

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Background: Simulation is an important adjunct to aid in the acquisition of surgical skills of surgical trainees. The simulators used to enable trainees to learn technical skills, practice skills and to be assessed in competency exams, need to be of the highest standard and to be of consistent design. Input into the design and makeup of task trainers used to teach surgical skills come from a multitude of sources. Enquiry into the perspectives of simulation has been described in the past but there is little description, in the literature, of the expectations of the desired features of the simulator itself.
Aim: This study investigates the perceived requirements of simulation and simulators used to acquire skills in the surgical field, particularly in limb exploratory procedures in trauma.
Simulation activity outline: This study concentrated on the implementation and desired features of simulators for the acquisition of surgical technical skills.
Methods: Semi-structured interviews were conducted until data saturation was achieved. An international group of 11 surgical educators and 11 surgical trainees, who had experience with surgical simulation, were interviewed via one-to-one video calls. The interviews focussed on the perceptions of simulation, the integration of simulators within a curriculum and the features of a simulator itself. This study concentrated on synthetic and virtual reality simulators for open surgical skills, as these types of simulators are open to design and redesign or adaptation. Interviews were recorded, transcribed and underwent thematic analysis. Ethical approval was obtained for this study.
Results: Analysis of the perspectives of surgical educators and surgical trainees on simulated training in open surgery yielded three main themes: (1) attitudes to simulation, (2) implementing simulation, (3) features of an open skills simulator. The majority felt simulation was relevant, intuitive and a good way for procedure warmup and the supplementation of surgical logbooks. They felt that simulation could be improved with increased accessibility and a variety of simulator options tailored to the learner. Suggested simulator features included greater fidelity, haptic feedback and more complex inbuilt scenarios. On a practical level, there was a desire for cost-effectiveness, easy setup and storage. The responses of the educators and the trainees were similar and reflected similar concerns and suggestions for improvement.
Implications for practice: There is a clear positive appetite for the incorporation of simulation into general surgical and limb trauma training. The findings of this will inform the optimal requirements for high-quality implementation of simulation into a surgical trauma curriculum. The findings will inform the optimal features desired in a simulator or task trainer design. The aim is to inspire a more considered design approach to optimize surgical skills training and ultimately lead to increased patient safety.

144 SIMULATION WITHOUT THE BELLS AND WHISTLES OF TECHNOLOGY

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Background: Full-scale simulation (FSS) is one of the most effective and commonly used simulation modalities in healthcare education. It enables the rehearsal of skills in a safe and controlled environment without the risk of harming patients, which provides a strong argument for it being a useful educational approach. With technological developments and the widescale use of simulation technologies in many institutions, simulation has become an essential part of healthcare professional training and curricula. However, setting up a simulation laboratory can be very costly for institutions, as can training facilitators and ensuring equipment maintenance. Simulated patients (actors) are also not universally embraced because of the costs. This makes running an FSS challenging. Furthermore, technology fear, shortage of trained staff, scarcity of space and equipment, workload and applicability to the existing curriculum can be acknowledged as further barriers to the adoption of FSS. We assert that Visually-Enhanced Mental Simulation (VEMS), which includes a patient poster instead of a patient simulator or simulated patient [1] and does not require a simulation laboratory, can be a potential alternative solution to FSS. This is particularly true for non-technical skills teaching.
Aim: This study aimed to explore nursing students' evaluation of the VEMS sessions.
Simulation activity outline: VEMS is a mental form of simulation which includes basic representations of a patient, equipment and interventions. A laminated patient poster is used to represent the patient and laminated equipment cards are used for equipment. A whiteboard or flipchart are used to write interventions and patient parameters in real-time. Also, the simulation session includes 'thinking aloud' (participants verbalize their thinking process and actions). Before the scenario, pre-briefing takes place, and a debriefing follows after the scenario, as in FSS.
Methods: As part of a wider project, we piloted the use of VEMS with 30 final-year adult nursing students who consented to participate in VEMS sessions. The main study relied on a quasi-experimental design to compare two simulation modalities,