SHORT REPORTS ON SIMULATION INNOVATIONS SUPPLEMENT (SRSIS)

Mind the gap! Modernizing simulation training with electronic patient records

Adam Bonfield[1], Elena Dickens[2], Charlotte Grantham[3], Darcy Fidoe[3], Mary Mushambi[4]

[1]*ST6 Paediatric Emergency Medicine, University Hospitals of Leicester, University of Leicester, Leicester, UK*
[2]*ST6 Medical Oncology, University Hospitals of Leicester, University of Leicester, Leicester, UK*
[3]*Department of Clinical Education, University Hospitals of Leicester, Leicester, UK*
[4]*College of Life Sciences, University of Leicester, Leicester, UK*

Corresponding author: Adam Bonfield, ab798@le.ac.uk

https://johs.com/article/doi/10.54531/AQPT5952

Introduction

The National Health Service (NHS) is undergoing a radical digital transformation to update systems and support long-term sustainability. One of the government's priorities is to ensure that all trusts have electronic patient records (EPRs) by March 2025 [1]. Despite this, simulation training has been slow to adopt such systems, often relying on dated paper charts and referral forms [2]. This affects the psychological fidelity and immersion of the learning experience, meaning our simulation exercises are increasingly unrepresentative of clinical practice. It is, therefore, important to incorporate technologies from clinical settings into simulation training to better prepare students and staff [3]. However, this has been impeded by a lack of bespoke EPR training software [4].

Innovation

At a UK-based university, final-year medical students undertake 'WardSim', a fully simulated ward comprising 3 clinical teams and 22 patient scenarios [5]. These scenarios include simulated patients, manikins and task trainers. The aim of this is to enable students to practise clinical and non-technical skills such as task prioritization, team working, communication and escalation in preparation for foundation training. We developed a customizable simulated EPR in collaboration with *Nervecentre* to embed into 'WardSim'. The simulated EPR was based on the live *Nervecentre*, which is used clinically by the local NHS trust. Features include observations, electronic prescribing and the facility to write discharge summaries. Investigation results were uploaded as PDF images onto the patient record.

Prior to 'WardSim', students familiarized themselves with *Nervecentre* by reading the user guide, completing an e-learning module and practising on clinical placements.

Submission Date: 28 March 2024
Accepted Date: 12 August 2024
Published Date: 31 January 2025

Evaluation

A mixed methodology was used to measure the impact of embedding *Nervecentre* into 'WardSim' through the completion of online pre- and post-session surveys. Using a 5-point Likert Scale (5 = high confidence, 1 = low confidence), the students' self-perceived confidence was assessed in eight areas. Qualitative data were collected through free-text responses, and an inductive thematic analysis was conducted to identify themes. Faculty members gave feedback focused on their views of *Nervecentre* in terms of its ease of use, educational benefit and student engagement with the software.

Outcomes

From 8th to 15th January 2024, 276 students and 43 faculty members participated in 'WardSim'. Pre-session and post-session surveys were obtained from 234 and 244 students, respectively, and post-session surveys from 37 faculty members. Student responses demonstrated a statistically significant increase in mean confidence scores across all areas. This included confidence with job prioritisation (2.6 vs 3.6, $p < 0.001$), documentation (2.7 vs 3.4, $p < 0.001$), communication (2.5 vs 3.6, $p < 0.001$), teamwork (3.2 vs 3.9, $p < 0.001$), preparedness for foundation training (2.5 vs 3.3, $p < 0.001$), EPR usage (2.7 vs 3.6, $p < 0.001$; Figure 1), electronic prescribing (2.6 vs 3.6, $p < 0.001$) and preparing discharges (2.7 vs 3.2, $p < 0.001$). Overall, students found the integration of *Nervecentre* into 'WardSim' useful (mean = 4.6) and easy to use (mean = 3.9), the latter mirrored by faculty (mean = 4.4). In addition, faculty felt that students engaged well with using *Nervecentre* and thought it to be educationally beneficial (mean = 4 and 4.7, respectively).

Analysis of free-text comments generated four major themes on the simulated *Nervecentre*: fidelity, utility, familiarity and prescribing.

Fidelity: Many of the student comments suggested it represented a more realistic and accurate representation of clinical practice.

Utility: Students consistently stated it was convenient and useful, especially to track patients and remain on task.

Familiarity: Being able to practise using *Nervecentre* in a simulated environment fostered greater awareness and confidence in using it clinically.

Prescribing: The ability to practise electronic prescribing of critical medications in a safe environment was particularly beneficial.

One free-text question asked about what could be improved with the simulated *Nervecentre.* The results are summarized in Table 1.

What's next?

Currently, the scope to integrate an EPR into simulation training is restricted by the lack or limited quality of such systems. We have demonstrated success in embedding an EPR into undergraduate simulation training. Our results show it can improve the simulation fidelity and provide valuable EPR training for application to clinical practice. This has the scope for further development in terms of in-programme features such as an integrated request system for ordering investigations. Locally, we are looking to incorporate an *Nervecentre* app into simulation training which seeks to rectify the issues students had using the web-based browser on tablets and will include the ability to digitally request investigations. We are also in the process of expanding the simulated EPR into other simulations and developing a student reference book. Furthermore, we are looking to introduce the electronic prescribing aspect of the simulated EPR into our

Figure 1: Comparison of confidence using an EPR system pre- and post-simulation.

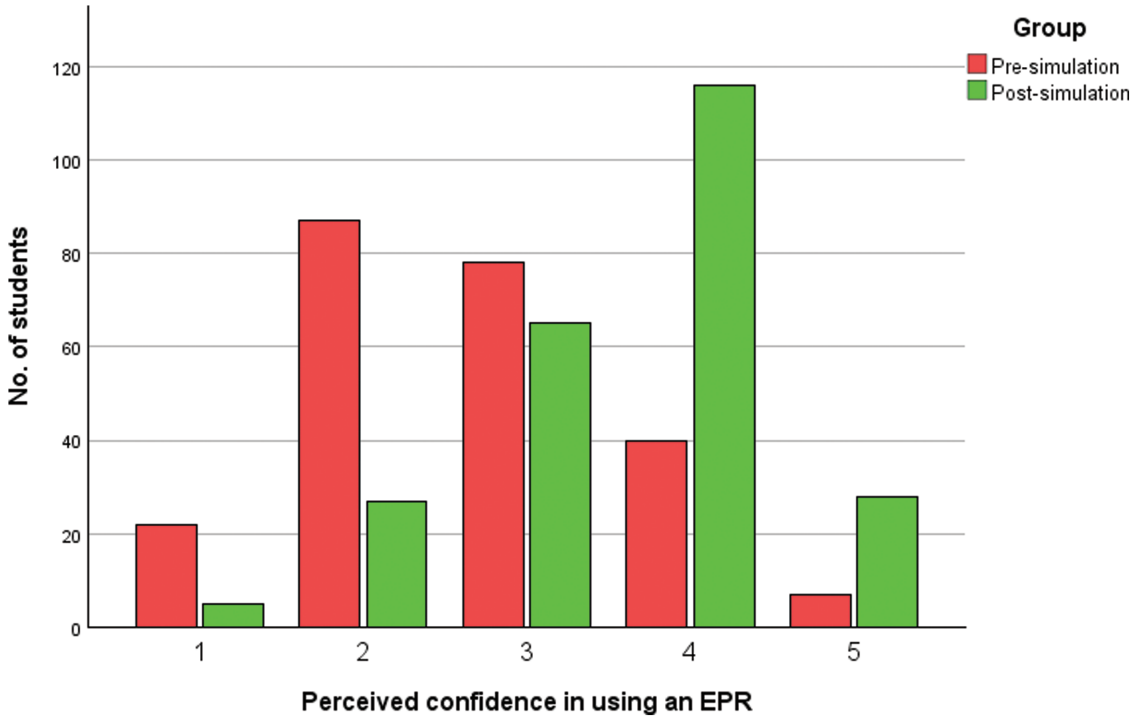

Table 1: Themes relating to improvement of the simulated Nervecentre

Training	Students wanted more training prior to using Nervecentre in 'WardSim'. Some students had limited experience with Nervecentre due to their placements being outside of the tertiary teaching hospital.
Requests/ results	Students would have preferred online investigation requests (i.e. CT/bloods) to be available and to see the results in real time
Devices	Students wanted more computers/tablets to access Nervecentre and found it difficult to use the web-based browser version on the tablets
Prescribing	Students would like to see if/when medication doses had been administered
More opportunities	Students wanted more simulation sessions with Nervecentre incorporated

pharmacology teaching block. We hope that these measures will enable students to experience it earlier in their training and should mitigate the issue we found around familiarity of *Nervecentre* prior to 'WardSim'. In addition, we are also incorporating the EPR into local postgraduate simulation training. It could be argued that this is an even more important application of the *Nervecentre* simulated EPR as this will encompass a multidisciplinary cohort of healthcare practitioners actively using EPR as part of their clinical roles. The current disconnect between their professional practice and simulated learning may have an even greater effect on fidelity and engagement, which the simulated EPR could alleviate.

Overall, we advise simulation educators to consider embedding EPR into both undergraduate and postgraduate training to improve translation of learning from the simulated to the clinical environment and promote research in this important area. To facilitate this, we encourage other EPR developers to design customisable simulated packages to bridge the gap between simulation training and clinical practice.

Acknowledgements

The authors wish to acknowledge the *Nervecentre* team for the development of the simulated EPR environment and for the ongoing help in improving the user interface for medical training.

Declarations

Authors' contributions

AB, ED and MM conceptualized the study innovation. CG, DF, AB and MM were responsible for design, data collection, analysis and interpretation of the results. All authors significantly contributed to manuscript preparation.

Funding

No direct funding was received, but support was received from *Nervecentre* in allowing the use of the Nervecentre software for teaching.

Availability of data and materials

Available on request.

Ethics approval and consent to participate

None declared.

Competing interests

The *Nervecentre* team adapted the local EPR to be used in a simulated capacity. None of the authors have any affiliation with *Nervecentre*.

References

1. Department of Health and Social Care. A plan for digital health and social care. London: NHS England. 2022 [updated 2022 June 29]. Available from: https://www.gov.uk/government/publications/a-plan-for-digital-health-and-social-care/a-plan-for-digital-health-and-social-care#section-1-embedding-digital-technologies [Accessed on 22 March 2024].
2. Rajaram A, Hickey Z, Patel N, Newbigging J, Wolfram B. Training medical students and residents in the use of electronic health records: a systematic review of the literature. Journal of the American Medical informatics Association. 2020;27(1): 175–180.
3. McMillan B, Davidge G, Nadeem F, et al. Navigating the electronic health record in university education: helping health care professionals of the future prepare for 21st century practice. BMJ Health & Care Informatics 2023;30:e100722. doi:10.1136/ bmjhci-2022-100722
4. Buttery A, Courtney R, Kirby A, Repton B, Roberts C, Thind A. Embedding electronic patient records into routine medical simulation across the South East of England, a pioneering regional collaboration. International Journal of Healthcare Simulation 2023;3(Suppl 1):A704.
5. Parker R, Hodierne L, Anderson E, Davies R, Elloy M. 112 Are final year medical students prepared for clinical practice: a simulation to observe inter-professional team working behaviours. BMJ Simulation & Technology Enhanced Learning. 2016 Nov 1;2:A63.