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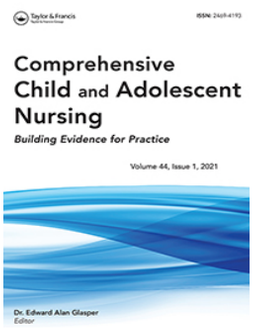

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COMMENT

Rising to the Challenge: The Delivery of Simulation and Clinical Skills during COVID-19

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ABSTRACT

The declaration of a global pandemic in March 2020 resulted in all higher education institutions having to quickly transform traditional didactic teaching and learning to online delivery. This involved delivering lectures and seminars virtually, and student contact time in University ceased immediately. Although many Universities had existing resources such as Blackboard® and Microsoft Teams® in place to assist with this delivery, the facilitation of clinical skills and simulation would prove to be more of a challenge. This paper explores how one University adapted and utilized innovative ways to provide students with virtual learning experiences, specifically in relation to the facilitation of clinical skills and simulation.

KEYWORDS

Simulation; clinical skills; Covid-19; pediatric; education; virtual simulation

Introduction

In March 2020, the declaration of a worldwide pandemic by the World Health Organization (WHO) (2020) and national lockdowns across many countries meant undergraduate children's nursing programs were forced to move from face to face teaching, to online in matter of days. In the UK and in line with Article 31 of European Council directive 2005/36/EC (2005), the regulatory body for nursing programmes (Nursing and Midwifery Council [NMC], 2018b) stipulate that undergraduate students must achieve a minimum of 2300 practice hours to qualify. As a result, UK Higher Education Institutes (HEI's) providing children's nursing programs had to adapt swiftly and promptly to meet the changing needs of the students. There was no time for staff to consider the best pedagogical approach for their learners or to engage in training programs for digital competency. Teaching had to continue and existing platforms such as Blackboard® and Microsoft Teams® were therefore utilized. Academics worked tirelessly to ensure they could provide the teaching and learning materials for their students and meet the outcomes for the curriculum; however, one element was to prove more challenging, this being the provision of simulation and clinical skills.

This discussion paper aims to explore what other HEI's did globally to enable the safe teaching of clinical skills and simulation during the pandemic. Further, it will discuss what lessons have been learnt and how this will change the future provision of simulation for children's nursing students.

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Background

Globally, the use of simulation in undergraduate nursing programs has been gathering momentum over the last 15 years. Simulation is now accepted internationally as a key pedagogical approach to enhancing nurse education (Lee & Peacock, 2020). The American anesthetist David Gaba gained international recognition for his invention of the first full-body advanced human patient simulator in the 1990s. Gaba has since become known as an expert in simulation-based education (SBE) and defines simulation as:

> ... a technique – not a technology – to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the world in an interactive manner. (Gaba, 2004, p. 3)

International research has identified a number of benefits of simulation for student nurses, including high student satisfaction (Baillie & Curzio, 2009), improved confidence (Wyllie & Batley, 2019), increased self-efficacy (Akhu-Zaheya et al., 2012) and development of critical thinking skills (Kim et al., 2016). Further, the simulated environment provides a safe, ethical alternative to practice placements enabling students to practice clinical skills, obtain feedback and reduce the risk of harm to patients (Hayes et al., 2015).

In the US, Pamela Jeffries has made significant contributions to simulation education, and most notably developed the National League of Nursing (NLN) Jeffries simulation theory (Jeffries, 2007, 2012). Although prominent scholars of simulation, Jeffries et al. (2015) note some significant challenges with simulation-based education (SBE). An effective simulated experience requires "buy in" from the participants and facilitators and creating authenticity is a crucial element in achieving this, both in clinical and social practices (Jeffries et al., 2015). Further, research from Canada measured a difference in student experience related to the level of fidelity involved in the simulation, with high fidelity showing favorable outcomes (Laschinger et al., 2008). However, Kim et al.'s (2016) meta-analysis in Korea was unable to prove a significant difference in the learning and student satisfaction between low- and high-fidelity simulations, concluding that educational approaches should be broad enough to satisfy all learning outcomes.

Despite such findings the global academic community continues to drive forward the implementation of SBE in prelicensure and undergraduate nurse training. In addition, regulatory bodies in the US and UK support the replacement of practice hours with simulation. In the UK, although there is no official cap on the number of simulation practice hours permitted to replace placement hours, the NMC (2018b) state that undergraduate programs can 'proportionately' use simulation-based education to support teaching and assessment. In the US, the National Council of State Boards of Nursing (NCSBN) propose that simulation can be used to replace up to 50% of practice hours (Hayden et al., 2014), but it is recognized that this varies from state to state. The use of simulation to replace practice hours for children's nursing students has become more apparent during the pandemic, with many children's services changing or adapting to enable qualified staff to support adult COVID patients. Thus, resulting in children's nursing students training in areas outside of their field.

In the UK, Baillie and Curzio (2009) conducted the first study that compared students from the same cohort who experienced a practice placement, with and without a simulation element. The results indicated that there was no disadvantage to those having some practice

placement hours replaced with simulation and the overall perception of those with the simulated hours was positive for both student and facilitator. More contemporary research findings from the UK and Australia support this; Larue et al. (2019) and Roberts et al. (2020) concluded that simulation hours could be part of the answer to the challenges of placement capacity and shortage of suitable clinical settings for accommodating high student numbers. However, despite these significant findings, nursing programs in Australia do not currently permit simulation to replace practice hours (Australian Nursing and Midwifery Accreditation Council (ANMAC), 2019). However, it must be noted that globally there are variances in the number of practice hours that students must achieve, with the UK having a much greater number of hours to fulfill than in the US and Australia.

Simulation in the UK nursing curriculum

With overwhelming support across the body of research for the use of simulation and through collaboration with students, the decision was made to commit to embedding simulation in the child, adult and mental health nursing curriculums at a University in the North West of England. The University was an early implementor for the new 'Future Nurse Curriculum" (FNC) (Nursing & Midwifery Council [NMC], 2018a) and the program started in September 2019. One exciting inclusion for the new program was 6 weeks of enrichment, which would take place each year in semester three. This was designed to offer students the choice of attending workshops, simulation and interactive sessions for three out of six of the themed weeks and completing online self-directed study for the other three. The six themes include; digital, global health, safe-guarding, Inter-professional Education (IPE), salutogenesis and mental health. This demonstrates a real shift in pedagogical practices and provides the students with some choice. The development of the FNC also provided an opportunity to change traditional assessment strategies and despite large student numbers, a group simulation assessment was created. Children's nursing students were able to create child-specific role-plays to demonstrate their knowledge of common childhood conditions through simulation. In addition, the head of simulation developed a timetable of optional IPE simulation days for the School of Health & Society for enhanced student learning.

Impact of COVID-19 on simulation in FNC

As COVID-19 hit the UK officially in March 2020, the new children's nursing curriculum for the September 2019 and January 2020 cohorts was in its second and first semesters, respectively. Like with many other nations across the globe, the UK government imposed a national lockdown and universities suspended all on-campus teaching. Teaching was moved online and in Greater Manchester the decision was made to remove all first-year students from practice. This resulted in first-year children's nursing students missing vital clinical hours and practice experience, as well as having their exciting opportunities within the new curriculum placed in jeopardy. This required a full-scale re-organization of year planners, timetables, teaching and learning materials and the dilemma of how simulation and clinical skills could be facilitated for these students.

A significant early change related to the group simulation assessments, scheduled for May 2020. This required students to undertake a 15 minute collaboratively designed group

simulation role-play to explore the multidisciplinary and nursing care needs of a simulated patient/person. For this assessment, example scenarios could include educating a child how to use a spacer and inhaler, pain assessment for a child with an appendicitis or breaking bad news to a child/family. Due to the closure of the university students were informed that the assessment would be undertaken using Microsoft Teams (MT). Facilitation of their simulated scenario across MT meant quickly adapting and amending their scenarios for online delivery. It was evident that the students embraced the challenge, using creative ways to facilitate an authentic scenario. For instance, some students had included props, adapted their clothing and used different background effects. Dieckmann et al. (2007) identifies that effective simulation depends on the learners participating in a fictional contract and agreeing to the concept of 'willing suspension of disbelief' (Coleridge, 1817). The ability to suspend disbelief was essential as the students were no longer able to use the clinical simulation suite or have access to clinical equipment/props. Muckler (2017) proposes that learners must be able to fully immerse themselves in the situation, to the extent that they believe what is happening is real, and as a result this enhances the learning experience (Davis et al., 2017; Pike & O'Donnell, 2010). As a moderator of the assessment, it was clear that the students were fully committed to providing an immersive experience and this exceeded all expectations.

For Year 1 students, the withdrawal from placement and a lack of hands-on clinical skills sessions meant they had received little practical experiences. As a result, 3 weeks of practice focussed learning was created. This included focussing on medicines management, professional values and episodes of care. The Oxford Medical Simulation® (OMS) virtual reality platform was used to support the students' learning. OMS run in both immersive virtual reality (VR) (via headset) and as a screen-based/desktop simulation with no VR headsets required. SBE is a well-known 'hands-on' pedagogical approach, however, virtual simulation has perhaps not been utilized to its full potential previously in nursing curricula. In the US, Espotito and Sullivan (2020) suggest that the pandemic has accelerated the opportunities to use virtual simulation to support clinical learning experiences. Previous research undertaken in Europe and Asia identifies that virtual simulation is an effective pedagogy which increases learner engagement and achievement (Padilha et al., 2019; Shin et al., 2019). However, one drawback of the OMS technology is the requirement for Windows 10 (for Macs Sierra OS or above), a device with minimum 8GB ram and 15GB storage and the platform is incompatible with tablets, smartphones and Chromebooks. Therefore, with the implementation of any new technology there must be digital support and options for students. To mitigate any perceived issues with software installation at the University of Salford, simulation 'pods' were created so that students could work together in groups, using MT to share their screens and navigate through the scenarios. OMS evaluated well from a student and academic perspective, but the issues with software and independent nature of learning did hinder some of the students learning. In response, for all subsequent cohorts of students OMS would be utilized as a facilitator-led resource, meaning that no student would be disadvantaged, and everyone is able to engage in some way. OMS offers access to over 50 clinical scenarios, seven of these scenarios relate to pediatric nursing and include pneumonia with respiratory distress, seizure, acute asthma, anaphylaxis, diabetic ketoacidosis, non-accidental injury and dehydration.

An additional online platform that was used to support practice-learning is ADInstruments® (Lt learning). This platform, designed for global use, includes a suite of

immersive case-based scenarios, clinical skills and physiology resources. The unique aspect of this platform is that the scenarios are focussed on real patient cases and include interviews with patients, carers and health and social care staff. There are two specific child cases, one relating to a child with a febrile illness and another focussing on childhood asthma. In the UK the NMC (2018b) emphasize the importance of involving service users and carers in the design and delivery of nursing programs. Research undertaken by Miller (2019) found that there are a number of benefits for involving young people in nurse education. This includes the enhanced authenticity of a scenario from the students' perspective and young people feel valued and listened-to. Thus, the use of virtual real cases assists with meeting the requirements of service user involvement in educative programs and enhances the learning experiences for students. It is hoped that there will be more resources added for children's nursing students in the future.

The final resource currently being used is Clinical Skills Net® which provides 280 illustrated step-by-step guidelines for clinical skills. This education platform provides peer-reviewed resources based on the most up-to-date guidelines and evidence. Like OMS and Lt, Clinical Skills Net has resources relating to children, mental health and adult nursing. Therefore, an additional benefit is that children's nursing students can use these resources to gain exposure to other fields of practice and vice versa, an essential component of all UK nursing programs (NMC, 2018b). Further, this could be of particular importance for students working in general emergency departments, or theaters where they may see both adults and children.

By introducing a variety of digital and virtual platforms to support students, the University of Salford has taken steps to overcome some of the challenges posed by the withdrawal of face to face teaching during the national lockdown and subsequent local restrictions. This form of learning is supported internationally. In the United States the Nursing Association of Clinical Simulation and Learning [INACSL] and the Society for Simulation in Healthcare [SSH]) consist of world-leading simulation experts. These experts endorse the use of simulation to replace clinical hours. More specifically, these organizations advocate the use of virtual simulation as a substitute for clinical hours and are requesting more flexibility from US regulatory bodies to enable this to happen (Foranda & Armstrong, 2020). Similarly, in the UK, the NMC (2018b) supports the use of simulation-based education for learning and assessment, however, the use of manikin and online resources for this purpose requires further clarity. Ford (2020) reports that HEI's are struggling to acquire clinical placements due to loss of clinical practice hours for opt-out and first-year students, COVID-19 restrictions and an increase in recruitment in September 2020. Therefore, the necessity to use simulation to replace clinical hours is now crucial. Moreover, the use of virtual and IT-based simulation must now be considered as an innovative and appropriate method of substituting practice hours in a proportionate way. The inclusion of the this in the NMC standards needs to be clear and concise for all nursing fields of practice.

The COVID-19 pandemic was a catalyst for academics across the globe to think differently about the delivery of simulation-based education and clinical skills. The implementation of innovative technologies, including virtual simulation and web-based resources are enhancing the teaching and learning for all children's nursing students. In the UK, Health Education England (HEE) (2020) has recently published a COVID-19 toolkit for safe simulation in health and care and provides guidance on blended learning approaches that

assist with the implementation of face-to-face learning. Further, HEE's technology-enhanced learning team and the Association of Simulated Practice in Healthcare (ASPiH) are working collaboratively with practitioners and academics to produce a useful set of 'how to' guides relating to simulation (Association of simulated practice in healthcare (ASPiH), 2020). Pywell et al. (2020) have provided the first 'how to' guide, on creating a virtual hospital via MT.

A further challenge of the immediate switch to online teaching was the lack of preparation and time available. There is no space within undergraduate nursing curriculums for students to have "time off". The delivery of clinical skills and simulation sessions had to be adapted and continue, leaving purpose-built simulation suites and high-fidelity manikins and equipment temporarily redundant. This required a dedicated clinical skills team to quickly transform timetabled face to face sessions to interactive workbooks, videos, quizzes and online question and answer sessions. The outcomes of these changes are yet to be evaluated. However, in a rapidly changing academic climate it is imperative to look more widely, not only reviewing the measures taken at the University of Salford but also examining what was developed in HEI's worldwide.

Making the most of the opportunities born out of the pandemic, in the US, Espotito and Sullivan (2020) successfully created a clinical nursing module, which included virtual simulation. The faculty were able to work collaboratively via video links and create virtual clinical simulations for the students. The timeline of delivery included pre-simulation work and videos as well as post-simulation work and debrief. In total, 100% of student evaluations rated the virtual sim positively. Feedback highlighted a heightened sense of teamwork, connectivity with peers and comprehension and achievement of the learning outcomes (Espotito & Sullivan, 2020). Although only 17 students were included in this study, the overwhelming positive results show that this could be rolled out for larger groups of students as an effective alternative face-to-face delivery. These findings are supported by Mok et al. (2020); in their discussion paper on resident training in Canada during the pandemic, they highlight how virtual simulation can replace in-situ simulation for medics. They state that by leading case studies in virtual simulation and making decisions on scenarios such as emergency resuscitation can support the learning of their clinical skills. Further support for the inclusion of virtual simulation is provided by research from Poland whereby a face-to-face simulation module for medics was moved online using Zoom® (Torres et al., 2020). The research found that although virtual simulation cannot replace psycho-motor skills training, it was a viable alternative for enabling students to train in vital skills such as; clinical reasoning, teamwork, decision-making, communication and critical thinking (Torres et al., 2020). These skills are all competencies required by nurses (NMC, 2018a) and this form of simulation could therefore be applied to similar scenarios in pediatric nursing education.

An alternative to virtual simulation is discussed by McDonall et al. (2020), they quickly and successfully adapted teaching in Australia for socially distanced simulation. Supported by the use of personal protective equipment (PPE), 3200 students were able to participate in a simulation across three campuses. This method enabled students to not only practice their hands-on clinical skills but also the donning & doffing of PPE. The simulation was still supported by the virtual environment with the use of videos for pre-learning, safety messages and debriefing. Unfortunately, due to the shortage of PPE in the UK, many universities including Salford donated their supplies to the local NHS trusts, rendering

socially distanced simulation with PPE impossible in the emergency period. However, from August 2020, PPE has been used effectively for OSCE assessments and the delivery of some face to face clinical skills and simulation.

Future of simulation

The research discussed and response to the pandemic offers several options for the provision of simulation through various platforms, utilizing the most up to date technology to enable academics to create learning experiences from remote locations. A further consideration when planning learning opportunities for children's nursing students is that not all simulation needs to be focused on clinical practice and emergency situations. Many nurses work in community settings, requiring autonomy and a wide range of skills. More notably in the UK, the NMC (2018a) state that pre-registration courses must ensure that newly qualified nurses are safeguarding ready; able to recognize, report and take prompt action for those that are vulnerable and/or at risk. Wyllie and Batley (2019) conducted a small-scale qualitative study on the effectiveness of simulation for safeguarding training for children's nursing students. Their findings from both observation and thematic analysis of semi-structured interviews resonated with simulation as the student's preferred learning style (Wyllie & Batley, 2019). The students reported increased confidence in recognizing and reporting safeguarding concerns, which is paramount when faced with the emotive and challenging situations in practice. Although this is a small study, which admittedly states that further research in this field is required, it does offer merit to the plans at the University of Salford to offer simulated child protection conferences, community visits and multi-disciplinary team meetings as part of their safeguarding strategy. Learning from how universities across the globe have utilized virtual simulation before and during the pandemic, these simulations will take place remotely. Students will be immersed in the scenario, through working as part of the team, making the assessments and decisions. The plan is to evaluate the findings and share with the wider academic community.

Conclusion

From a review of the literature and discussion within this paper it is clear that further research is required into the use of virtual simulation and supportive technologies such as OMS and Lt. The emergency pandemic period has provided academics from across the globe with opportunities to embrace the technology and be bold in trying new pedagogies to support the ongoing learning of our students. It is imperative that the use of virtual simulation, simulation in non-traditional teaching such as safeguarding, and the use of new technologies are rigorously evaluated. Further, if academics report and share their findings there will be more evidence to support the call for further clarity from regulatory bodies on the use of simulation to contribute to practice hours.

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