SEUP
SOCIEDAD ESPAÑOLA DE URGENCIAS DE PEDIATRÍA

EMERGENCIASPediátricas
Vol. 3. No. 1. January - April 2024

Emerg Pediatr. 2024; 3(1): 52-54

SCIENTIFIC LETTER

Assessment of simulation as a training tool in Pediatric Emergency Medicine

Mª Elena May Llanas[1], Anna Mª Pizà Oliveras[1], Sandra Bustamante Hernandez[1], Carla Crous De Batlle[1], Anna Bertrán Jufresa[2]

[1]Pediatrician, [2]Head of the training and teaching unit of the nursing department. Hospital Universitari MutuaTerrassa. Terrassa, Barcelona

Early detection and treatment of children at risk of cardiac arrest is one of the priorities in pediatrics, both in primary care and hospital settings. However, the low incidence of such events in children often leaves healthcare personnel feeling unprepared to handle situations for which they are trained but rarely encounter in daily practice. Simulation enables these professionals to train in clinical procedures analogous to real-life situations, allowing for continuous improvement that will have an impact on the safety and satisfaction of the professionals and the team, as well as on patient care and survival.

We present our experience in simulation of scenarios involving critically ill children as a tool for continuing training in pediatrics, and its assessment by the professionals who participated in the simulations.

The aim of our study was to describe the experience in clinical simulation in critically ill children conducted at our center during the 2021-22 academic year and to present the evaluation of this experience by the students.

Between October 2021 and May 2022, the Department of Pediatrics of the Hospital Universitari Mútua Terrassa carried out a training in clinical simulation in critically ill children, following the model of the Centre Internacional de Simulació i Alt Rendiment Clínic of the Fundació Universitària del Bages, Campus Manresa of the UVic-UCC[(1)]. This model consists of a preliminary phase that includes a needs analysis, setting objectives and expected outcomes, designing the activity and scenario, followed by the simulation itself. The simulation process involves pre-briefing, the simulation experience, and debriefing, which should transition from reflective observation to the application of skills in a real-world setting. At the end of the training, participants were asked to evaluate the experience using an online form. The survey adapted from that of Astudillo et al.[(2)], with slight modifications (the question regarding video recording was excluded, and questions about whether they would change anything and whether they would repeat the experience were added). Responses to the questions were rated on a scale from 1 (strongly disagree) to 5 (strongly agree). All participants provided consent for the use of their responses.

The previous online training consisted of four videos created by the instructors themselves ('Pediatric CPR Guidelines 2021 of the European Resuscitation Council' and 'Care of the Critically Ill Child, TAP and the ABCDE System,' and 'Approach to the Most Common Severe Pediatric Pathology I and II'). In addition, six clinical simulation sessions were conducted, addressing common severe conditions in pediatrics. In each session, the case of an infant and of an older child were presented (Table 1). The main aim of the training was to review the approach to critically ill patients using the Pediatric Assessment Triangle and the ABCDE triage system. The Laerdal® Megacode Junior® and Megacode Baby® manikins and the SimStart® constant simulation monitor were used. Participants were divided into 4 groups, each consisting of 2 nurses, 2 anesthesia residents, and 4 pediatricians, including residents and attending physicians from both primary care and hospital settings. The sessions were held outside working hours in a classroom in the teaching building of the institution, with a frequency of one session every 4 weeks. Of the 32 participants, 30 responded the online survey. According to professional groups, 23.3% were nurses, 20% were pediatric residents, 16.7% were primary care pediatricians, 20% were hospital pediatricians, and 20% were anesthesia residents. The mean scores of the responses are shown in Table 2. A total of 96.7% of the participants

Received on June 23, 2023
Accepted on September 26, 2023

Corresponding author:
Dr. Elena May Llanas
E-mail: marilenmay@gmail.com

TABLE 1. Clinical simulation cases.

Session 1. Respiratory failure Child: asthma Infant: bronchiolitis
Session 2. Circulatory failure Child: anaphylaxis Infant: dehydration
Session 3. Neurological disorders Child: intracranial hypertension secondary to hemorrhage Infant: seizure
Session 4. Others Child: polytrauma Infant: intoxication
Session 5. Cardiac arrest with a shockable rhythm Child: sudden death in sports Infant: congenital heart disease
Session 6. Cardiac arrest with a non-shockable rhythm Child: sepsis Infant: sudden death

would take the course again, and 63.3% would not make any changes to the course organization. Among the suggested modifications, 10% of the respondents requested a change of schedule, so that it would take place within working hours.

Clinical simulation enables the recreation of rare clinical scenarios in a safe environment where errors have no consequences for the patient, improving clinical care and safety both for the patient and the professional. We chose to conduct repeated sessions over time because we believe that this improves performance more than single sessions[3]. We designed multidisciplinary teams, although not natural ones, in which each professional performed their usual role based on their expertise. The sessions were held outside the usual timetable and environment, which may be considered a limitation, but this prevented cancellation of the sessions due to healthcare duties. The feedback from the professionals who participated regarding organization, learning, and application of knowledge was highly positive.

There are different levels of assessment of training activities[4]. Our study only evaluated professional satisfaction (Kirkpatrick level 1) and not the knowledge acquired (levels 2 and 3) or the impact on routine practice (level 4)[5], for which different tools are available in the literature, especially for resident training, such as the Clinical Performance Tool[6], the Tool for Resuscitation Assessment Using Computerized Simulation[7], the Resuscitation Team Leader Evaluation[8], or the Simulation Team Assessment Tool (STAT)[9]. Our aim for the near future is to prospectively evaluate the improvement of knowledge and attitudes throughout the course.

Clinical simulation of critically ill children carried out by multidisciplinary teams is a good tool for the continuing education of professionals caring for these patients in centers with a low incidence of such cases. It enables maintaining or improving knowledge and skills while increasing the confidence and safety of the professionals who care for these children. Assessment of the training activities, including the student's perception, evaluation of the acquired knowledge, and its application in daily practice, allows for continuous improvement in these activities.

FUNDING

The authors declare no financial support for this article.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

TABLE 2. Results of the assessment survey.

Question	Mean score (range)
Simulation is a useful learning tool	4.96 (4-5)
The simulation scenarios are realistic	3.96 (2-5)
The simulation experience has improved my clinical skills	4.86 (4-5)
Simulation is useful to develop critical thinking and decision-making skills	4.9 (4-5)
The simulation cases are tailored to my theoretical knowledge	4.53 (2-5)
The experience with the simulator has enhanced my safety and confidence	4.29 (4-5)
The simulation has helped me to combine theory and practice	4.86 (4-5)
The workshops with the simulator have motivated me to learn	4.83 (3-5)
Case duration is adequate	4.86 (4-5)
Knowledge of the faculty is adequate	4.96 (4-5)
Simulation fosters communication among team members	4.93 (4-5)
Clinical simulation helps to prioritize actions	4.93 (4-5)
Interaction with the simulation has improved my clinical competency	4.86 (4-5)
Overall, the experience with the simulation has been satisfactory	4.93 (4-5)

REFERENCES

1. Camps A, Dalmau O. Disseny i planificació d'experiències de simulació. Disponible en: https://ucf.cat/sites/default/files/docs/2023/ucf_8_disseny_i_planificacio_experiencies_simulacio.pdf. Consultado en septiembre de 2023.
2. Astudillo A, López M, Cádiz V, Fierro J, Figueroa A, Vilches N. Validación de la encuesta de calidad y satisfacción de simulación clínica en estudiantes de enfermería. Cienc Enferm. 2017; XXIII(2): 133-45.
3. Ghazali DA, Fournier E, Breque C, Stéph Ragot SP, Oriot D. El efecto de las simulaciones inmersivas repetidas cada 6 semanas en la evolución del rendimiento de un equipo multidisciplinar durante un año: un ensayo controlado aleatorizado en situaciones pediátricas de riesgo vital. Emergencias. 2019; 31(6): 391-8.
4. Qué es el modelo Kirkpatrick. Disponible en: https://www.escueladidactica.com/que-es-el-modelo-kirkpatrick/. Consultado en septiembre de 2023.
5. Thim S, Henriksen TB, Laursen H, Schram AL, Paltved C Sondergaard Lindhard M. Simulation-Based Emergency TeamTraining in Pediatrics: A Systematic Review. Pediatrics. 2022; 149(4): e2021054305.
6. Donoghue A, Ventre K, Boulet J, Brett-Fleegler M, Nishisaki A, Overly F, et al. Design, Implementation, and Psychometric Analysis of a Scoring Instrument for Simulated Pediatric Resuscitation: A Report from the EXPRESS Pediatric Investigators. Simul Healthc. 2011; 6(2): 71-7.
7. Brett-Fleegler MB, Vinci RJ, Weiner DL, Harris SK, Shih MC, Kleinman ME. A Simulator-Based Tool That Assesses Pediatric Resident Resuscitation Competency. Pediatrics. 2008; 121(3): e597-603.
8. Grant EC, Grant VJ, Bhanji F, Duff JP, Cheng A, Lockyer JM. The development and assessment of an evaluation tool for pediatric resident competence in leading simulated pediatric resuscitations. Resuscitation. 2012; 83(7): 887-93.
9. Reid J, Stone K, Brown J, Caglar D, Kobayashi A, Lewis-Newby M, et al. The Simulation Team Assessment Tool (STAT): Development, reliability and validation. Resuscitation. 2012; 83(7): 879-86.