

High-fidelity simulation for paediatric trainees: An assessment of costs and trainee perceptions

Dr Nicholas Schindler, Dr Amy Ruffle
East of England School of Paediatrics

Background

High fidelity simulation has been shown to be a valuable learning tool in paediatrics¹. Courses aimed at paediatric trainees moving from level one (SHO) to level two (registrar) training are becoming routine in the United Kingdom². Many such courses are using simulation in varying ways to prepare trainees to additional responsibility of their new roles. One of the most commonly cited barriers to simulation is cost³, however there is limited literature about the specific running costs associated with high fidelity simulation⁴.

Objectives

To explore the financial costs of delivering a “ready for registrar” day and utilise feedback from trainees to identify what they value most in such a course and thereby how to maximise cost-effectiveness in the future.

Methods

In August 2016 we delivered a high fidelity simulation course for trainees within the East of England School of Paediatrics who were due to move from level one to level two training posts the following September. The aim of the course was to prepare them for this transition by simulating common scenarios that they may not have encountered or led in their current roles.

The one day course consisted of six high fidelity acute clinical scenarios and three communication skills scenarios. The faculty was made up of two consultant paediatricians with extensive experience in simulation, two level two paediatric trainees and a senior paediatric nurse.

Formal evaluations were collected from trainees on the day and again the following October, one month after they had started in their new posts. Funding was obtained through a Health Education England scheme promoting simulation initiatives. The day was free for paediatric trainees within the East of England.

Results

All paediatric ST3 trainees within the East of England were invited to attend the course (n=30) with the number of places restricted to 15. 12 registered and 10 attended on the day.

The costs associated with the day are shown in this table

Items	Cost
Simulation centre	£1,800
Administration	£0 (Trainee administered)
Faculty	Included in sim centre cost
Per trainee (12 trainees)	£150
Non-attendance (2 trainees)	£300

Evaluations were received from 8/10 trainees on the day and again one month after they had commenced their level 2 training posts. We were able to identify three key themes regarding what trainees value from simulation as a learning experience:

Paediatric trainees participating in simulation value

- **Clear scenarios with relevance to every-day working practice.**
- **Scenarios targeted at their specific stage of training.**
- **Personalised feedback.**

Evaluations on the day suggested that the course had helped to improve trainees’ confidence in becoming a registrar. This was maintained in the repeat feedback from all trainees who after one month in their new posts had all encountered situations similar to at least two of the scenarios from the course. The most common example given was management of severe sepsis out of hours.

“Helped me keep a clear calm head in A&E on a night shift when a severely septic neonate came in.”

We also identified that with increasing group size in scenarios, trainees felt that they received less focused and personalised feedback and that these were therefore less valuable experiences.

“Scenarios with three trainees present – probably harder for all 3 to get fully involved – although appreciate that numbers make smaller group sizes impossible “

Conclusions

Feedback from trainees attending our course suggested that relevant scenarios, targeted to their stage of training increased their confidence in the work place. Their comments reinforced the perception that high fidelity simulation is more valued in small groups partly because of the opportunity for greater participation and individualised feedback.

There are additional time costs associated with administration, however these did not translate into monetary costs thanks to the commitment of time by the faculty, particularly trainees. We suggest that trainee involvement in planning and delivery of simulation is therefore likely to be cost saving.

We did not compare trainees’ experience of the high fidelity environment with other forms of simulation. Low fidelity simulation is substantially cheaper and further research would be useful in determining if it can produce equivalent learning in the context of a “Ready for Registrar” course.

There is a balance to be struck between cost per trainee and each individual’s learning outcomes. Trainee feedback would suggest this depends on the number of trainees directly involved. We hypothesise that the ideal number is two per simulation scenario .

The cost of our course was £150 per trainee and therefore registered trainees not attending on the day was associated with a significant loss of cost effectiveness. We would encourage other course organisers to share their data to allow for further learning on how to achieve greater cost effectiveness in high fidelity simulation.

Take home message

- **Relevant high fidelity simulation is valuable to paediatric trainees**
- **Our course cost £150 per trainee**
- **Important factors in improving cost effectiveness are**
 - **Maximising attendance**
 - **Trainee involvement in organisation**

References

- 1 Eppich W, Adler MD, McGaghie WC. Emergency and critical care paediatrics: use of medical simulation for training in acute paediatric emergencies. *Curr Opin Paediatr* 2006;18:266–71.
- 2 Moore H, Vrach AA, Lok A, et al. Immersive Paediatric Simulation: Implementation of a Mandatory Regional Paediatric Simulation Course. *The Journal of the Society for Simulation in Healthcare*. December 2013; 8(6):471
- 3 Linda Clerihew, David Rowney, Jean Ker. Simulation in paediatric training. *Arch Dis Child Educ Pract Ed* 2016;101:8-14
- 4 Zendejas B, Wang AT, Brydges R, et al. Cost: the missing outcome in simulation-based medical education research: a systematic review. *Surgery* 2013;153:160–76