



# Using an Escape Room to Provide Training on Necrotizing Enterocolitis to Registered Nurses in a Pediatric Cardiac Intensive Care Unit

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## Introduction

- Infants with congenital heart disease (CHD) commonly experience necrotizing enterocolitis (NEC).
- Registered nurses (RNs) who take care of these patients must be familiar with the early signs and symptoms of NEC to allow for prompt diagnosis and treatment, which could improve outcomes.
- Intestinal ischemia occurs due to the cardiac lesion in infants with both CHD and NEC<sup>2</sup>. Ischemia results in injury and cell death, leading to the classic symptoms of hematochezia, hemodynamic instability, abdominal distention, and abdominal tenderness.
- According to one study, 28% of infants requiring surgical intervention due to NEC did not survive<sup>1</sup>.
- A need for continuing education on NEC was identified in a CICU; therefore, the purpose of this study is to examine the effectiveness of an escape room-based training on NEC among CICU RNs.

## Methods

- A one-group posttest only design using an escape room-based training was conducted in a sample of 59 RNs caring for infants with CHD in an inpatient CICU within a large, metropolitan pediatric hospital.
- Researchers designed an escape-room based educational intervention consisting of a six-question case study. The escape room was set up on a rolling cart depicted in Figure 1.
- The learning objectives of this training were as follows:
  - The RN will be able to:
    1. Identify risk factors for NEC in infants with CHD.
    2. Discuss the early signs and symptoms of NEC in infants with CHD.
    3. Identify appropriate diagnostic studies to identify NEC in infants with CHD.
- After the escape-room based educational intervention, quantitative data was collected using a demographic form, the Perceived Competence Scale (PCS) to evaluate perceived competence scores following the intervention, and a researcher-developed course evaluation.
- Qualitative interview questions were included to clarify and understand the participants' experiences with the intervention.
- University and hospital IRB approval and verbal informed consent obtained prior to recruitment and data collection.

Figure 1 Rolling Cart Design

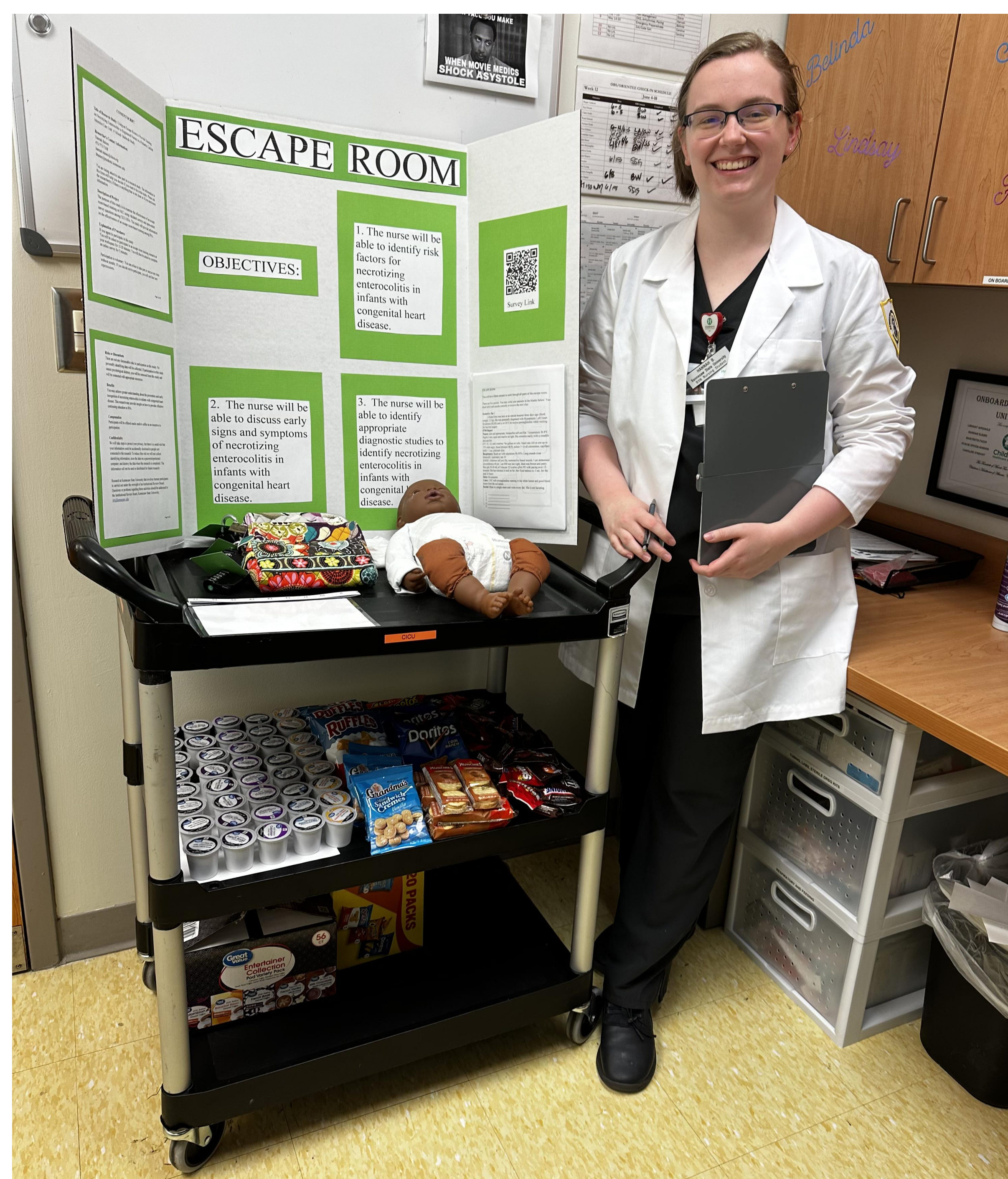


Table 1 Responses to Course Evaluation Questions

| Likert Scale  | How would you rate the overall effectiveness of the instructor's teaching? | How would you rate the overall effectiveness of the mobile escape room as a teaching method? | The training gave me a deeper insight into the assessment and early recognition of NEC. | How satisfied were you with this training? |
|---|--|--|---|--|
| 1-Not effective at all/ Strongly Disagree/ Not satisfied at all | 0%   | 0%   | 1.9%  | 0%   |
| 2-Ineffective/ Disagree/ Unsatisfied                            | 0%   | 0%   | 1.9%  | 0%   |
| 3-Neutral   | 3.8%   | 0%   | 1.9%  | 1.9%                                       |
| 4-Effective/ Agree/ Satisfied                                   | 13.2%  | 9.4%   | 15.1%   | 7.5%                                       |
| 5- Extremely Effective/ Strongly Agree/ Extremely Satisfied     | 83.0%  | 90.6%  | 79.2%   | 90.6%                                      |
| Mean (Standard Deviation)                                       | 4.79 (0.495)   | 4.91 (0.295)   | 4.68 (0.779)  | 4.89 (0.375)                               |

## Results

- Descriptive statistics were examined to determine levels of competence and satisfaction following the escape room-based training.
- The mean PCS scores were high after receiving the intervention (18.42). The PCS has a minimum score of four and a maximum of twenty.
- Findings also demonstrated high mean scores for satisfaction (4.89) and effectiveness of the escape-room based training (4.91) following the intervention. Results of the course evaluation survey are described in Table 1.
- Open-ended questions suggest that participants planned several practice changes, including increased collaboration, advocacy, and awareness of early signs and symptoms.

## Conclusion

- Findings suggest the escape-room based training was effective in providing engaging continuing education.
- Limitations from the analysis suggest future studies with larger samples using a pre-test, post-test design is needed.
- Further research focusing on comparing the effectiveness of escape-room based training to more established educational methods, such as traditional classroom education, is warranted.
- Given the complexity of CHD and higher prevalence of NEC among these infants, proper training for RNs is essential.
- Findings have the potential to improve nursing education techniques and health outcomes in infants with CHD and NEC. Improving the quality of continuing education for pediatric nurses may improve health outcomes for their patients.

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