Simulation-based medical education training was effective in improving short and long-term competency in, and knowledge of CVC insertion" Cartier et al (2016).

Abstract:

BACKGROUND: Multimodal educational interventions have been shown to improve short-term competency in, and knowledge of central venous catheter (CVC) insertion.

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OBJECTIVE: To evaluate the effectiveness of simulation-based medical education training in improving short and long-term competency in, and knowledge of CVC insertion.

DESIGN: Before and after intervention study.

SETTING: University Geneva Hospital, Geneva, Switzerland, between May 2008 and January 2012.

PARTICIPANTS: Residents in anaesthesiology aware of the Seldinger technique for vascular puncture.

INTERVENTION: Participants attended a half-day course on CVC insertion. Learning objectives included work organization, aseptic technique and prevention of CVC complications. CVC insertion competency was tested pretraining, posttraining and then more than 2 years after training (sustainability phase).

MAIN OUTCOME MEASURES: The primary study outcome was competency as measured by a global rating scale of technical skills, a hand hygiene compliance score and a checklist compliance score. Secondary outcome was knowledge as measured by a standardised pretraining and posttraining multiple-choice questionnaire. Statistical analyses were performed using paired Student's t test or Wilcoxon signed-rank test.

RESULTS: Thirty-seven residents were included; 18 were tested in the sustainability phase (on average 34 months after training). The average global rating of skills was 23.4 points (±SD 4.08) before training, 32.2 (±4.51) after training ($P < 0.001$ for comparison with pretraining scores) and 26.5 (±5.34) in the sustainability phase ($P = 0.040$ for comparison with pretraining scores). The average hand hygiene compliance score was 2.8 (±1.0) points before training, 5.0 (±1.04) after training ($P < 0.001$ for comparison with pretraining scores) and 3.7 (±1.75) in the sustainability phase ($P = 0.038$ for comparison with pretraining scores). The average checklist compliance was 14.9 points (±2.3) before training, 19.9 (±1.06) after training ($P < 0.001$ for comparison with pretraining scores) and 17.4 (±1.41) ($P = 0.002$ for comparison with pretraining scores). The percentage of correct answers in the multiple-choice questionnaire increased from 76.0% (±7.9) before training to 87.7% (±4.4) after training ($P < 0.001$).

CONCLUSION: Simulation-based medical education training was effective in improving short and long-term competency in, and knowledge of CVC insertion.

Reference:

Cartier, V., Inan, C., Zingg, W., Delhumeau, C., Walder, B. and Savoldelli, G.L. (2016) Simulation-based medical education training improves short and long-term competency in, and knowledge of central venous catheter insertion: A before and after intervention study. European Journal of Anaesthesiology. 33(8), p.568-74.

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