Using full-scale simulation to teach pharmacology for pre-hospital care providers

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Background

Pharmacology remains an important, but often difficult learning field for pre-hospital care providers. In a novel, one-day course format we used full-scale simulation to reinforce learning and allow participants to experience pharmacological concepts and implications in a realistic pre-hospital context. A special challenge was a multi-professional approach including various levels of medical qualification from Emergency Medical Technician (EMT) to critical care paramedic. The scenarios were designed to address pharmacological objectives. Structured debriefings facilitated the understanding of links between pharmacological actions and clinical changes of the simulated patient. A total of 63 participants evaluated their level of knowledge, skills and competencies regarding pharmacology before and after a one-day simulation course. In 18 students, self-evaluation was additionally measured 6 months after the intervention. A 8-point likert scale (1=basic, 8=advanced) based on the European Qualification Framework (EQF) was used for the self-evaluation. Paired t-tests and a general linear model were used to calculate longitudinal differences. Additionally to self-evaluation, results of a student-satisfaction survey were analyzed.

Methods

Using full-scale simulation to teach pharmacology

Results

After the intervention, students rated their qualification on pharmacology significantly higher when compared to the pre-course evaluation. Both knowledge (2.46 vs. 3.43) and skills (2.76 vs. 3.59) improved by nearly one EQF level, competencies also improved from 3.24 to 3.70 on the 8-point likert scale. All differences are statistically significant (P<0.001) using paired t-tests. After 6 months, non-significant improvements where identified in knowledge (2.94 vs. 3.33) and skills (3.33 vs. 3.66) using a general linear model with repeated measures. Evaluation of competency after 6 months was slightly reduced (3.83 vs. 3.5, p=0.001). However, a subanalysis for under-graduate students revealed significant improvement of knowledge (1.00 vs. 3.75), skills (1.5 vs. 4.25) and competencies (2.25 vs. 3.50) even after 6 months.

Discussion

A complex topic like pharmacology challenges a multi-professional approach. As expected, effects were highest for fully qualified paramedics and paramedical students and less significant for others. A minor decrease in competence levels after 6 months may be caused by a more critical self-evaluation after course contents were reflected. Strong effects within the group of paramedic students may be enhanced by additional professional development after the intervention.

Conclusion

▷ Knowledge, skills and competencies improve significantly after a one-day simulation training.

▷ Knowledge and skill-levels remain high even 6 months after the training.

▷ Effects are still significant after 6 months in the under-graduate group.

▷ Students enjoy simulation training which may has interdependent positive effects with overall learning.