Does a simulation course lead to improved management of an emergency situation. (Clinical and non-clinical skills).

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Background

A simulation course was offered to final year students. Each student was exposed to five emergency and elective medical scenarios with simulated patients and/or mannequins followed by extensive video- feedback. The aim was to investigate if participation in the course led to any changes in management of a standardized emergency scenario.

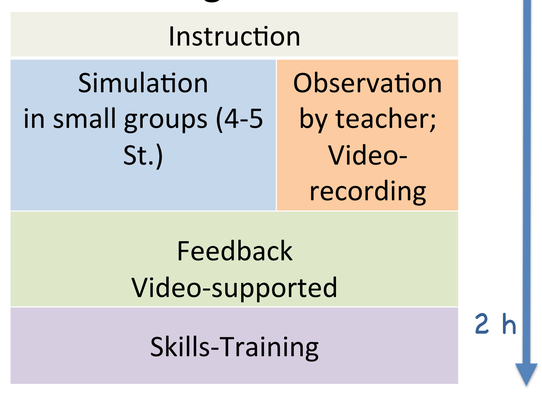
Research Question

- Does the simulation-course lead to any improvement of the management of an emergency scenario?
- Does a Simulation Course lead to improved non-technical skills.

Methods

The intervention group (n = 44) completed an emergency scenario before and after completion of the simulation course. Clinical performance was rated with a checklist (Tab. 1) and non-technical elements were rated (Tab. 2) using the ANTS system (1). Two raters were used. All scoring was repeated for a control group (n = 22) who did not participate in the simulation course.

Course design:



Endpoints	Yes	No	Time (sec)
Diagnose: Ventricular Fibrillation			
Begin effective Cardiac massage			
1. ECG Attached			
1. Correct Defibrillation			
1.Correct Drug application			
Guideline appropriate management			N/A
Return of Spontaneous Circulation (ROSC)			

Table 1: Checklist End Points

Rating Label	Description
4 – Good	Performance was of a consistently high standard
3 – Acceptable	Peformance was of a satisfactory standard
2 – Marginal	Performance indicated cause for concerned
1 – Poor	Performance endangered or potentially endangered patient safety, serious remediation is required
N – Not observed	Skill could not be observed

Table 2: Rating Non-technical-Skills

Results

Domain	T-Value	P-Value	Con. Interval Min	Con. Interval Max	Cohen's d
Team.management	1,1875	0,2417	-0,1608	0,6205	0,32
Team-Working	-0,1313	0,8963	0,4589	0,4031	0,04
Situation Awareness	-0,6398	0,5259	-0,5732	0,2974	0,17
Decision.making	0,5932	0,5561	-0,3085	0,5658	0,16

Table 4: Comparison of Anaesthetic Non-Technical Skills

End Point	T-value	P-Value	Con. Interval Min.	Con. Interval Max.	Cohens d
Diagnose: Ventricular Fibrillation	-0,8365	0,406	-35,3769	14,4951	0,19
1. ECG Attached	0,4507	0,6543	-18,3945	29,0218	0,11
1. Correct Defibrillation	2,1257	0,0406	1,9684	84,6662	0,6
1.Correct Drug application	2,6901	0,0103	11,4474	80,5158	0,73
Guideline appropriate management	1,044	0,3024	-33,4233	105,0924	0,28
Return of Spontaneous Circulation (ROSC)	0,7551	0,4572	-52,4694	113,2471	0,28

Table 4: Comparision End points achieved

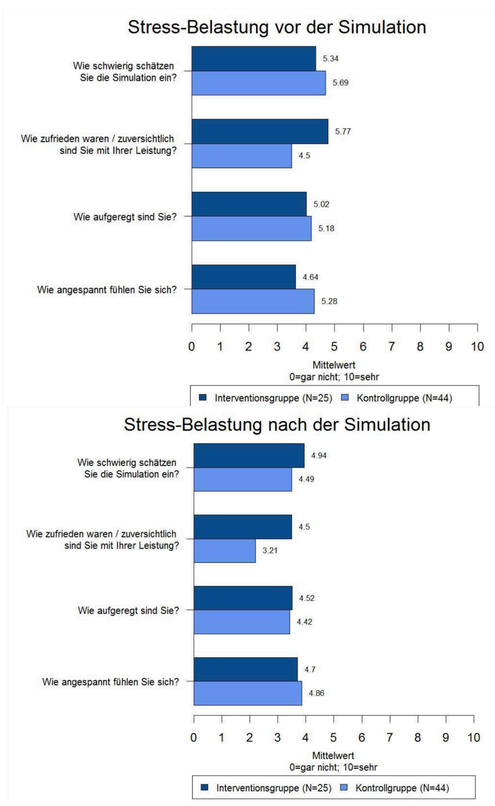


Table 5: Anxiety scores before and after

DISCUSSION:

The intervention group showed increased ROSC (Tab. 3) and reported being more confident of the challenge (Tab. 5) of an emergency simulation, This may be extrapolated to improved management and increased confidence in dealing with unknown situations. Course duration was only five weeks, perhaps an extended duration may have shown significant differences in non technical skills (Tab. 4). Competence crosses all three domains of knowledge, skills and attitudes and requires time to be mastered. Establishing and quantifying competence are extremely difficult processes, requiring intricate measurement techniques. Clinical competence encompasses both clinical capability and non-technical skills. Simulation by increasing personal confidence and facilitating learning may help to develop competence, however longer exposure and experience is required.

Conclusion

A simulation and skills training course as an introduction to the internship year enables an improvement of students' magement of a resuscitation scenario (2) but more research need s to be done in assessing non-technical skills.

1. Fletcher, G., Flin, R., McGeorge, M., Glavin, R., Maran, N., & Patey, R. (2003). Anaesthetists' non-technical skills (ANTS): Evaluation of a behavioural marker system. British Journal of Anaesthesia, 90(5), 580–588.
2. Mañeru, G., Altarejos, M., & Rodríguez-Sedano, A. (2011). Learning by simulation - An educational experience in the simulation center of the school of medicine of the university of navarra. Procedia - Social and Behavioral Sciences, 28, 253–258. https://doi.org/10.1016/j.sbspro.2011.11.049