Early acquisition of non-technical skills using a blended approach to simulation-based medical education

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BACKGROUND

Non-technical skills and Crisis Resource Management (CRM) are emerging as important components of postgraduate medical education.

Between 2013 and 2016 a blended training program incorporating non-technical skills was introduced at an Australian teaching hospital.

METHODS

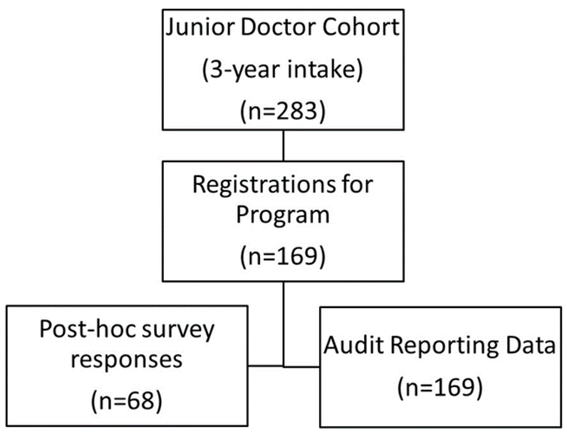
The program was conceived and delivered by interdisciplinary faculty trained in simulation-based medical education[1]. The '*blended approach*' combined open access online resources with multiple opportunities to participate in simulation-based learning.[2]

Objectives:

- To examine the value of the program to the participants
- To examine the effects on the Medical Emergency Team (MET) system.

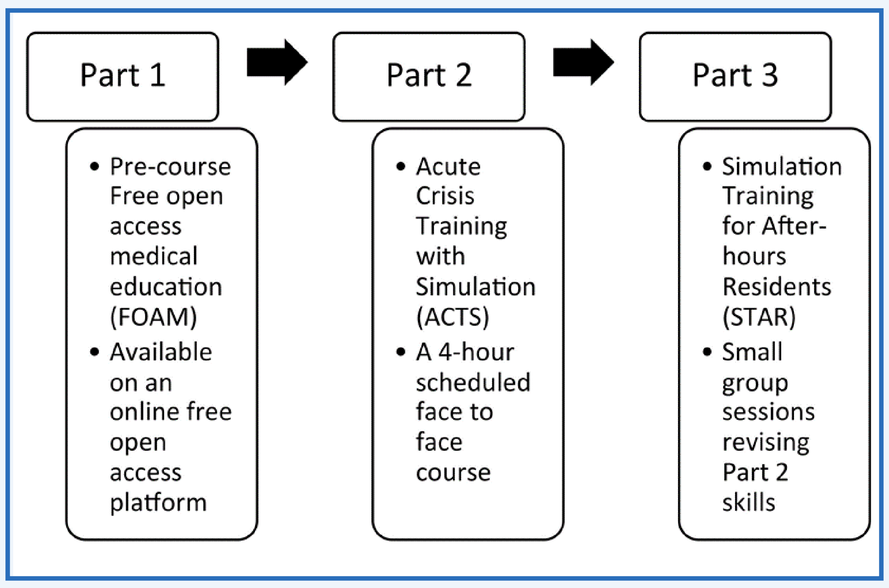
Mixed methods evaluation:

- A prospective collection of data from simulation centre registrations and evaluations. Data collected between 1st January 2014 and 30th June 2016 (Table 1)
- A '*post-hoc*' reflective survey of the enrolled participants. The survey invitations sent to 169 participants (response rate was 40.2%.)
- A retrospective review of hospital-wide MET call 'quality improvement' data (Table 3)
- Stata 11 was used for descriptive statistics.



PROGRAM SUMMARY

- **Setting**: A university affiliated hospital incorporating a small interdisciplinary simulation centre staffed by nursing and medical staff.
- **Participants**: Junior doctors
  (For the study '*Junior Doctor*' was defined as a postgraduate year 1 '*intern*' or postgraduate year 2 '*resident*' starting their training between 2014-2016).
- **The Program**: Divided into 3 major components (see figure opposite)[2] Over 30 months, 283 junior doctors were invited to enrol in the program.



RESULTS

. Completion of the 4-hour course (Part 2) was achieved by 169/283 doctors (59.7%).
. Our online course materials (Part 1) were accessed a total of 939 times.[2]
. The faculty delivered 82 brief simulation-based revision sessions (Part 3) (Table 1).
. Overall, 48/68 (70.5%) of surveyed participants attended one or more of these revision sessions. (Normal variance in rostering patterns resulted in revision sessions being attended by doctors who were not enrolled in the Part 2 course). Overall experience was rated ≥ 6/10 by 65/68 (95.6%) of survey respondents. 56/68 (82.4%) felt more confident & 51/68 (75.0%) felt their care was safer (Table 2).
. Content analysis the survey indicated a range of areas for improvement (Table 4).
. An extensive program improvement initiative has since been completed.[2]

TABLE 1 - Overview of the Blended CRM Program

	Full year 2014	Full year 2015	Half year 2016	Total
Intern intake (number of postgraduate year 1 doctors)	96	98	89	283
Part 1 - course manual views online	85	489	365	939
Part 2 - number of attendees at 4-hour CRM program	36	73	60	169
Part 3 - number of weekly revision sessions	20	36	26	82
Attendance of weekly revision simulations (median)	4	5	6	N/A
Total number of trained faculty	7	16	21	(*21*)

TABLE 2- Participant Survey Evaluation (n=68)

	Yes/More	About the same	No/ Less	No Response
Do you believe you are providing safer patient care as a result of this training? n(%)	51/68 (75.0%)	7/68 (10.3%)	2/68 (2.9%)	8/68 (11.8%)
Do you feel more confident managing the deteriorating (unstable) patient? n(%)	56/68 (82.4%)	9/68 (13.2%)	1/68 (1.5%)	2/68 (2.9%)
Do you believe future interns would benefit from increased access to Simulation? n(%)	49/68 (72.1%)	17/68 (25%)	0/68 (-)	2/68 (2.9%)

TABLE 3 - Medical Emergency Team (MET) Calls

	Full year 2013	Full year 2014	Full year 2015	Full year 2016	% Change 2013-2016
Number of Reported In-hospital Cardiac Arrests (overall total)	67	45	41	38	-42.3%
Number of MET Calls - Level 1 response (a primary team review)	6409	7017	8342	8696	+26.3%
Number of MET Calls - Level 2 (a full life support team)	1266	1473	1706	2037	+37.9%

TABLE 4 - Themes from Qualitative Content Analysis

'Most valued aspect of CRM training?'	'Most valued aspect of revision simulations?'	'Issues that detracted from the experience?'	'Which scenarios would be useful for future learning?'
Blood Gases	Communication	Timing of sessions (before a shift)	Cardiac (Bradycardia, Tachycardia)
Communication	Calling for Help	Actors '*distracting*'	Septic Shock (Hypotension and Fever)
The Learning Environment	Debriefing	Debriefing was 'too long'	Respiratory (Shortness of Breath)
ECG	Common Scenarios	Pagers answered during session	Escalation (Graded Assertiveness)
Practice	Deteriorating Patients	Group '*too large*' or '*too small*'	Neurological (Coma, Delirium and Seizures)
Feedback	Teamwork	Manikin *'not real'*	Haemorrhage (Gastro-intestinal and Trauma)

REFERENCES

(1) National Health Education and Training in Simulation (NHET-Sim)
http://www.monash.edu/medicine/nhet-sim
(2) Coggins A. Acute Crisis Training with Simulation (Free Open Access Medical Education)
https://emergencypedia.com/2014/11/27/acute-crisis-training-with-simulation-acts

TAKE HOMES

. Acquisition of '*non-technical skills*' is a current challenge in postgraduate medical education.
. Retention of new skills can be supported by the 'serial opportunities' for additional simulation.
. As a result of feedback, learning objectives of this program are now linked with nursing education and '*in-situ*' simulation.
. Delivery of the program was achievable with limited simulation resources and a part-time faculty. Following the program introduction there was a decline in rate of cardiac arrests and there was a self-reported increase in participant confidence.