

## Evaluation of workshop for training house-officers and medical officers on medical emergencies using simulation for workplace preparedness

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**Background:** House-officers and medical officers are at the forefront during medical emergencies in the ward and casualty which impose cognitive, communication, social and system challenges and yet, training in this area is commonly lacking. A workshop was conducted using simulation to provide training on some acute medical emergencies like cord prolapse, post-partum haemorrhage with collapse, poly-trauma and acute exacerbation of asthma.

**Objective:** To determine the effectiveness of simulation in developing competency in managing selected clinical emergencies

**Methodology:** There were 22 participants consisting of house-officers, junior medical officers and nursing clinical instructors. Only doctors were included in the study. Four medical emergencies were chosen viz.: Cord prolapse; post-partum haemorrhage with collapse; poly-trauma and acute exacerbation of asthma. The simulated sessions were conducted using high fidelity manikins and simulated patients. Simulated patients were trained and moulage was applied accordingly. The skills stations were on airway equipment and techniques of application, latest cardiac life support algorithm and hands on chest compression using manikins.

**Results:** A 5 point Likert scale used to rate the sessions. The skills station had 65% (n=13) rating as excellent and 35% (n=7) good. The skills simulation was rated excellent by 75% (n=15) and good by 25% (n=5) of participants. Verbal feedback was that it was very refreshing, informative, and helpful in terms of improving their skills.

**Conclusion:** The simulated skills training for the junior doctors was very well received and maybe beneficial for work preparedness and in the long run address patient safety.

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*Keywords: Junior doctors, medical emergencies, medical curriculum, resuscitation, simulation, work-preparedness.*

### Introduction

Over the last decade, there has been a gradual increase in the number of newly graduated doctors and at the same time a reduction in chances for hands on practical skills as well as exposure to acute management skills. There are more doctors than there are opportunities.<sup>1</sup> There has been an increase in the number of doctors joining the workforce in recent years.<sup>2</sup> Medical simulation has come alive over the last decade and appears to be gaining grounds at a fast pace<sup>3, 4, 5</sup> Trevor, in his paper on simulation training for emergency medicine residents aptly states: "See one, simulate many, do one competently and teach everyone."<sup>6</sup>

Simulation provides an enhanced environment allowing one to have experiential learning and in learning important clinical skills that are not being performed regularly; one such being the management of medical emergencies.<sup>7</sup> We conducted a medical emergency workshop covering selected medical emergencies from internal medicine, obstetrics and trauma for junior doctors (house officers and 1<sup>st</sup> year medical officers), allowing them to sharpen their skills and revisit important equipment.

### Objective

The objective of the study was to determine the effectiveness of simulation in developing competency in managing selected clinical emergencies.

### Methodology

This is a descriptive cross-sectional survey involving junior doctors, two to three years in service and house-officers who were several months in service after graduating from medical school. For the purpose of this survey, we define a "junior doctor" as a qualified medical practitioner, having a working experience of three years or less including the period of internship and registered with the Malaysian Medical Council. The workshop was conducted at the simulation centre located at the Clinical School of the International Medical University

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in September 2014. A flyer was sent out to all hospitals (private and public) in Malaysia inviting doctors to participate in this workshop. The number of participants was limited to 16-20 as we felt higher numbers will affect the hands on experience and effective learning. Four medical emergencies that were commonly seen at the hospital setting were chosen so that the experience would be more meaningful for the participants:

- Cord prolapse (pre-course)
- Post-partum haemorrhage with collapse (pre-course)
- Poly-trauma
- Acute exacerbation of asthma

All participants who signed up for the workshop were invited to participate in the evaluation. There were 22 participants who signed up for the workshop; 20 doctors and 2 nursing clinical instructors (signed up on site though the flyer specifically mentioned that it was for junior doctors). Doctors were from various disciplines namely orthopaedics, surgery; gynaecology and emergency medicine. House-officers and medical officers with two to three years of service were included while doctors more than 5 years in service and nursing staff were excluded from this survey.

It was a one day workshop conducted with two instructors, nurses and students who acted as nurses and patients. They were trained by faculty on their respective roles. We started the session in a seminar room with a fifteen minutes lecture on introduction to medical emergencies and simulation. Towards the end of the lecture, there was a staged sudden emergency call for help to the “labor room” where participants found a patient with a pathological CTG (cardiotocogram) due to a cord prolapse. This was then followed by another emergency call to “labor room” as a ‘patient’ had become unresponsive due to post-partum hemorrhage. This was done to create a sense of realism so as to sustain the attentiveness of participants and improve immersiveness. It also set the stage for what was to come for the rest of the day making them more attentive and prepared.

The participants rotated through a total of three facilitator-run stations, each lasting 30 minutes. The first station was on airway equipment, the second station involved the use of the defibrillator and last station was on the latest updates with regards to cardiac life support (latest AHA guidelines) with practice of chest compression on part-trainers. The airway equipment station had all the devices commonly used in hospitals during an emergency such as the mask with self-inflating bag, the oropharyngeal and nasopharyngeal airway, laryngoscope, the laryngeal mask airway, endotracheal tube with stylet, suction devices and oxygen therapy devices (various types of oxygen masks). The defibrillator is a device that not many young doctors get to operate during their rotations so at this station, defibrillation and cardioversion was discussed and the technique of using the defibrillator was revised with all participants, who had experience using this equipment on a manikin.

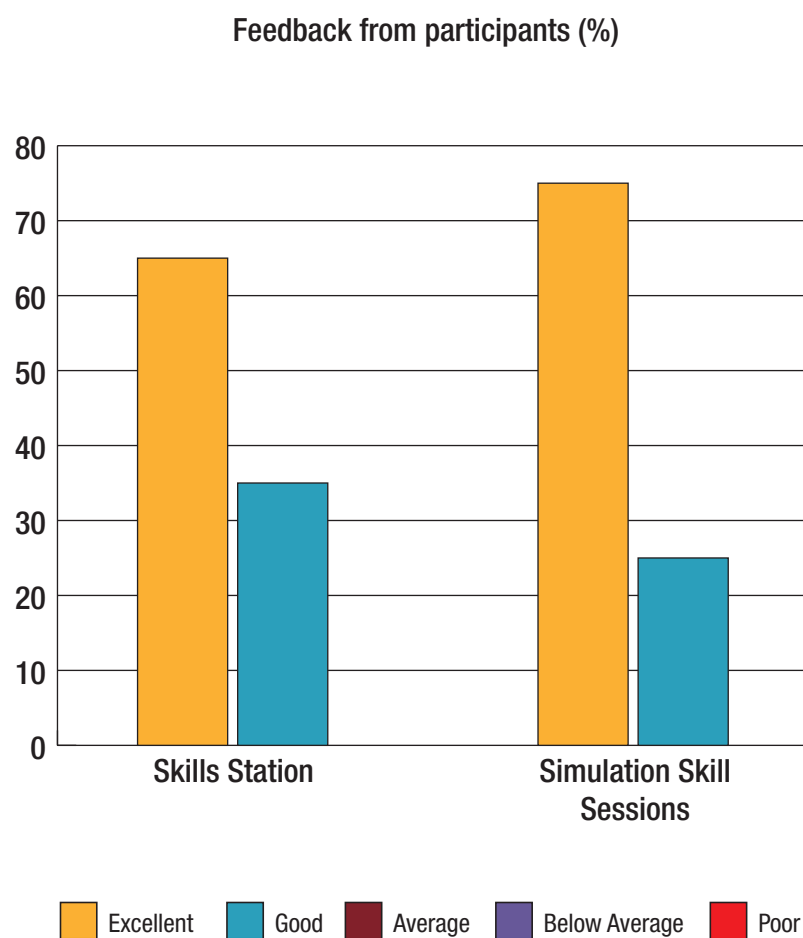
The station on the latest cardiac life support guidelines had the facilitator update them on the latest changes in the resuscitation guidelines. Then participants went on to perform chest compression on a part-trainer who was able to give them an instant feedback on the effectiveness of their chest compression.

The practical session was followed by the “put together session” where participants were given a situation and had to manage the “patient” (SP followed by manikin) using the equipment that were introduced to them at the practical stations earlier. Scenarios for trauma and asthma were created using simulated patients (SP) and high fidelity manikins. The SPs were our own medical students who were trained and on whom moulage had been applied. At the end of the course all participants completed a questionnaire using a 5 point Likert scale to rate the knowledge and skills gained at the skills stations and simulated sessions; 5= excellent, 4= good, 3=average, 2= below average and 1= poor. As this was a practical workshop, no ethical clearance was needed.

## Results

Of the 22 participants, 17 were doctors from public hospitals, 2 doctors from private practice, one doctor from a university and 2 nursing tutors from a nursing college. The doctors were all from various disciplines (surgery, orthopaedics, casualty less than five years in service). Nurses were excluded from the final assessment scores.

Rating for the skills station by the participants was favourable with 65% (n=13) excellent; 35% (n=7) good. The skills simulation rated 75% (n=15) excellent, 25% (n=5) good (Figure 1). Verbal feedback was that it was very refreshing, informative, and helpful in terms of improving their skills (Table 1).



**Figure I:** Feedback on skills stations

**Table 1:** Qualitative feedback from participants through focus group discussion

1.	Very refreshing, very informative, interactive, excellent simulation & guide
2.	More programme
3.	Longer course will be helpful
4.	For a full day course, more scenario
5.	Very good workshop
6.	Very interesting and helpful
7.	Make us think out of the box
8.	Good to learn
9.	Beneficial & Overall excellent

## Discussion

During the feedback session at the end of the workshop, participants were able to reflect on the fact that they had forgotten a lot of skills especially the systematic way of performing resuscitation on a collapsed patient. A medical emergency is any medical problem that could cause death or permanent injury if not treated quickly which also includes severe pain.<sup>8</sup> Junior doctors, more specifically, the house-officers are usually the first to respond when there is a medical emergency in the ward.<sup>9</sup> At the same time there has been a renewed awareness and drive for patient safety which demands that those responsible for training develop effective training methods, maximising the use of modern technology.<sup>10</sup> The simulation-based training offers the opportunity to enhance junior doctors' skills at recognising and handling emergencies and this has been proven in some studies.<sup>11,12</sup> Additional studies are required to measure the long-term retention of the acquired skills, as well as the effect of training these healthcare professionals. House-officers need to be well equipped to handle at the very least, the common medical emergencies and initiate the necessary early resuscitation strategies that will ultimately ensure a good patient outcome. Cameron *et al* found only a few studies concerning the transition from student to junior doctor during a systematic review

of literature that measured or explored one or more factors affecting preparedness at workplace. The studies appear to indicate that most junior doctors feel they are not adequately prepared for practice.<sup>13</sup>

Simulation training improves provider and team efficiency as well as competency on manikins.<sup>14</sup> The challenge would be in the transference of these competencies to the real workplace. A well-structured management plan or protocol on common emergencies can be used to train young doctors when they newly graduate to ensure that they become confident and competent during a real life emergency situation. A survey by Thng *et al*, of non-specialist doctors posted to the emergency department (ED) on their perception of high-fidelity simulation teaching, showed that all (100%) participants felt that high-fidelity simulation teaching was most effective in improving knowledge base in resuscitation work while 97 % felt that the session allowed them to train their critical decision making skills.<sup>15</sup>

Team work is an important factor that can affect patient outcome. Doctors work as a team all the time with support staff and when faced with an emergency situation, some things are essential; being calm or at least appearing calm, quick assessment of the situation

followed by prioritisation of the management will help prevent an irreversible situation and that would be the ideal. Junior doctors with inadequate experience would benefit from training as a team. Simulation does allow for repeated exposure and training within a team and in turn could reduce stress somewhat and improve outcome.<sup>16,17</sup>

We used a combination of simulated patients who presented with the initial complaints followed by the high fidelity human patient simulator when the 'patient' collapsed which helped to improve the state of realism for the participants. Use of high fidelity human simulators in a realistic clinical situation appears to help develop the ability to recognise when to use skills learnt to manage one type of emergency on another emergency not previously encountered.<sup>12,18</sup>

One of the drawbacks here is that there are places where there is no structured compulsory basic life support training for junior doctors that is followed by the more advanced life support training as they become more senior in practice in our country. Most of the participants at our workshop realised that they were not well updated on the latest practices in cardiac arrest and by our observation during the simulated exercise, were a little lost during cardiac resuscitation. Most universities in our country introduce basic life support training to medical students and some like ours also expose them to advanced training before they graduate.<sup>9,19,20</sup> Exposure to simulation training regularly could help doctors remain prepared for emergencies throughout their careers and not have a propensity to forget the basics because they are posted to certain disciplines where emergencies are rare.<sup>16</sup>

Feedback like these from junior doctors who have just started practice is essential for universities who can then plan the curriculum delivery towards producing graduates who are better work prepared and are able to meet the real world working life more confident and equipped.<sup>21,22,23,24</sup> Wayne *et al.* found that a curriculum featuring deliberate practice and simulation technology

dramatically increased the skills in ACLS scenarios among internal medicine residents.<sup>25</sup> The participants, during the debriefing and group discussion felt that longer sessions and more scenarios for practice would help increase their skills.

### Limitation

The major limitation is the number of participants in this survey, which is quite small. The effectiveness of the experience and learning was based solely on participants' self-assessment and feedback. Nurses joined the workshop though we targeted only the junior doctors. The fact remains that we had feedbacks for immediate learning on the day of the workshop. Future studies need to be done with a larger sample size to assess the needs of junior doctors to be well trained to be competent in managing medical emergencies.

### Conclusion

The study indicated that simulated skills training for the junior doctors could be beneficial in terms of work preparedness and in the long run address patient safety. Looking at the overall positive responses from the young doctors and as a way forward in improving future healthcare, we should look at ways to provide these training sessions in a more regular and constructive manner. From the responses drawn from this study, clearly there is a need for well-constructed training programmes for junior doctors in the public service.

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