Original article

Tutors Perception on a Training Workshop on Simulation Based Medical Education

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Abstract:

Background: The notion of 'learning by doing' has become less acceptable especially when invasive procedures are needed. Simulation provides learners the opportunity for deliberate practice. Universiti Kebangsaan Malaysia Medical Centre (UKMMC) is one of the promoter of Simulation-based medical education (SBME), conducting regularly "train the trainer workshop" aimed to increase the efficiency of learner. The objective of this paper is to provide an insight from the learners' perspective on a SBME workshop. **Methods**: It was a pre and post-test design survey, done on a total of 21 participants of UKMMC who attended a 2-daytrain-the-trainer workshop on SBME held in April 2014 at Simulation Lab of Emergency Department. Participants were exposed to interactive-lectures, hands-on with scenario design-development using high fidelity simulator and trying out the scenario with simulation. Each simulation session lasted around 30 minutes, followed by a 15-minute debriefing and 10-minute didactic session. During debriefing, video clips of what participants did were shown. Participants completed pre-post evaluation on their pre-experience, usefulness of SBME and as feedback-method, and meeting the objectives of SBME-workshop. **Results**: Post-test evaluation showed 100% participants reported simulation was very useful compared to 43% in the pre-test. While 83% agreed feedback was better served by video-re-run in post-test compared to 43% in the pre-test. Most expressed that the workshop achieved the desired objectives. **Conclusion**: The SBME is an effective method to gain medical-procedural experience and is well accepted by the participants. Medical schools should use simulation as an educational tool in order to increase the efficiency of learners.

Keywords: simulation; medical education; tutor training

Introduction:

Health care simulation is an important educational tool that allows the trainees to practice experience within a safe learning environment without exposing the patients to preventable harm and thus improve patient safety and reduce the incidence of adverse events.[1] Simulations are now in widespread use for professional education and personnel evaluation that

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include devices, trained persons, life like virtual environments, and contrived social situations that mimic problems, events, or conditions that arise in professional encounters.[2] In the last two decades the confidence on simulation technology in medical education has increased to enhance the learner knowledge, provides controlled and safe practice opportunities and shapes the acquisition of young doctors' clinical skills.[3,4] Simulation allows the students to better understand conceptual relations and dynamics and makes the text book, diagrams, graphs come alive.[5] At least five factors contribute to the rise of simulations in medical education: (a) problems with clinical teaching; (b) new technologies for diagnosis and management; (c) assessing professional competence; (d) medical errors, patient safety and team training; and (e) the role of deliberate practice.[4] Medical educators realise that SBME can contribute a lot to improve medical care by boosting medical professionals' performance and enhancing patient safety.[6] The notion of ''learning by doing'' to gain knowledge and procedural skills in medical education has become less acceptable, mainly when invasive procedures and high-risk care are needed.[7] Medical educators have prompted to seek alternative methods to teach medical knowledge and procedural experiences. Simulation provides learners the opportunity for deliberate practice, so that the learners can make mistakes in a safe environment, learn from those mistakes and achieve proficiency by attaining predefined benchmarks.[8] Simulation-based health education strategies range from part-task trainers, computer based, simulated patient to integrated simulators. Part task trainer models are meant to represent only a part of the real thing and will often comprise a limb or body part or structure. Simulated patients are the commonly used in medical education while integrated simulators combine a manikin -usually a whole body with sophisticated computer controls that can be operated to provide various physiological parameter outputs.[9] The prime idea underlying SBME is that increased practice in learning from mistakes and in error management in a simulated environment will reduce occurrences of errors in real life and will provide professionals with the correct attitude and skills to cope competently with those mistakes that could not be prevented.[6] .

Simulation in medical education has been incorporated in the medical curriculum of UKMMC and UKMMC is also one of the promoter of SBME, conducting regularly "train the trainer workshop"

aimed to increase the efficiency of future health care providers. The objective of this paper is to provide an insight from the tutors' perspective about SBME as determined by the pre and post questionnaire evaluation.

Materials and Methods:

It was a pre and post test design questionnaire survey, conducted on a "train-the-trainer workshop on SBME" held in April 2014. The workshop was held as a-2 day program at the Simulation-Laboratory in Accident and Emergency Department of UKMMC. A total of 21 participants comprising of medical officer and science officers of UKMMC attended the workshop. Participants were exposed to interactive-lectures, hands-on with scenario design-development using high fidelity simulator and trying out the scenario with simulation. They were divided into four groups randomly in order to ensure that medical simulation-based techniques can be mastered by the participants of the workshop. Participants completed evaluations where they expressed their pre-experience on simulation, usefulness of SBME and SBME as feedback-method and about the achievement of workshop objectives. The workshop was delivered following the principles of education and health care simulation, comprised of interactive-lecturers and hands-on-practices sessions on simulation. The lecture session encompasses five topics: i) the first one was on 'Adult Learning', participants were given a description of andragogy and how to make effective and interactive learning. Simulation based learning are mainly used for adult learners who are pre occupied with previous experiences. They learn best with experiential learning: learning by doing, thinking about, and assimilation of lessons learned into everyday behaviors.[10] ii) The second topic was on 'Scenario Design & Development' where techniques of scenario formation for simulation based teaching were introduced. iii) The third topic was on 'Developing Learning Outcomes', where the importance of learning outcomes on formation of scenarios for simulation based teaching were emphasized. iv) The fourth topic was on 'Assessment Methods during Simulation'. Assessment drives learning and learning drives practice, [11,12] it should be guided directly by the objective.[13] In this topic, the pparticipants were exposed with different techniques of assessment either with rating scale or checklist or both. v) The fifth and the last topic was related to the 'Debriefing'. Debriefing represents the feedback which is a facilitated reflection in the

cycle of experiential learning.[14] Participants exposed to the proper debriefing techniques to ensure the availability of self-reflection and evaluation of simulation done to hold the repair in the future. They were asked to tryout their scenarios with alpha and beta testing among their groups and with other groups respectively. The importance of alpha and beta testing were emphasised in order to ensure the scenarios were designed that resemble to real-life situations in the clinical field.

The hands on exercise session comprised of actual simulation where the participants experienced 'learning by doing'. Participants worked in groups to create a scenario and worked on high fidelity simulators. In this phase, the clinical status of a patient was controlled remotely using a wireless computer with patients' vital signs displayed on a monitor at the bedside. Participants were taught to scrutinize the practicality of their scenario by alpha testing. They were then tryout their complete scenario with another group, for example, Group A scenario against B and group C scenario against D and vice versa. In each practical or simulation session, there was interactive case last about 30 minutes, followed by a 15-minute debriefing session and another 10-minute didactic session on the key points of learning. During debriefing, video clips and photos taken earlier during the practical session were shown to the participants and commented on by the lecturers. The learners were asked to give feedback on the actions they have taken and their understanding on it. Discussion was directed towards the learning objectives.

At the beginning of the workshop, a pre-assessment test was applied to determine the level of knowledge and awareness of the participants about the simulation-based learning in medical education. At the end of the session, a post-assessment test was applied using the same questionnaire to assess knowledge and awareness gained after attending this workshop. The evaluation questions comprised of demography of the participants, their pre experience about SBME, their knowledge about the usefulness of incorporating a clinical scenario into procedural teaching using simulator, perception about useful method of feedback from the debriefing in clinical simulation, and achieving the desired goals of the workshop relating to acquiring procedural skills through simulator. A-5-point Likert scale was used to rate the parameters and the data was then compiled, analysed and presented as number percent distribution. The study was ethically approved by ethical Committee of Universiti Kebangsaan Malaysia (UKM) Medical Centre.

Results:

Table -1 showed the demographic profile of the participants. Among the 21 participants 38% were male and 62% were female. Total 71% participants were medical doctors who had previous experience in SBME during their residency training; however the simulation training was without the supervision of a trained facilitator. The rest 29% participants were science officer, who were graduated as medical lab technologist and did not have experience in clinical simulation.

Table-2 revealed the knowledge about the usefulness of incorporating a clinical scenario into procedural teaching using simulator. Pre-workshop evaluation showed that 43% participants perceived it as very useful while 29% rated it as useful and 29% rated as average useful. Post-workshop evaluation revealed that all participants were aware about the importance of the formation in a simulated clinical scenario and 100% agreed that this is a very useful procedure.

Figure-1 showed the perception of the participants about the useful method of feedback from the instructor to the learners in SBME. Pre-workshop evaluation showed that most of the participants felt that the effective mode of feedback on simulation was through the verbal and written method. Seventy one percent participants reported that verbal was the useful method while only 43% reported video re-run as the useful method of feedback. But after attending the workshop, most of them perceived that feedback to be better served by video re-run and verbal feedback method. Post-workshop evaluation data is 86% for each verbal and video re-run method while only 19% for written method.

Table-3 showed the participants' opinion with respect to achieving the desired goals of the workshop relating to acquiring procedural skills through simulator. In terms of understanding of SBME 48% and 38% participants rated the

Table 1: Demographic profile of the participants (n=21)

Demography	Variables	Number	Percent
Gender	Male	8	38
	Female	13	62
Experienced in SBME	Yes	15	71
	No	6	29
Position	Medical doctors	15	71
	Science officer	6	29

Table 2: Knowledge about the usefulness of incorporating a clinical scenario into procedural teaching using simulator

Usefulness	Pre-workshop		Post-workshop	
	Number	Percent	Number	Percent
Very useful	9	43	21	100
Useful	6	29	0	0
Average	6	29	0	0
Not useful	0	0	0	0
Not useful at all	0	0	0	0

workshop as very good and good respectively, while 43% rated very good as well as good in scenario design & development; 38% rated good and 52% rated very good about debriefing. Most agreed that the workshop has achieved the desired objectives and the participants are confident in implementing SBME.

Discussion:

The SBME is increasingly being used for teaching and training in health care.[15] Medical training needs live patients to acquire the skills of health professionals, but there is also an issue about the patients' safety. The SBME alleviate this anxiety by developing health professionals' knowledge, skills, and attitudes while protecting patients from unnecessary risk.[16] Therefore, SBME is a very effective teaching tool for health professionals to acquire the knowledge and skills instead of using the live patients. This study gives us an insight on the perception of tutors about SBME where 29% of the tutors reported that this workshop is the first experience for them (Table-1).

Participants have significantly improved their knowledge on usefulness of simulation based medical education. Though, initially they were not very confident about the usefulness of a simulation, after the training workshop they attended 100% agreed that SBME is a very useful method of teaching in clinical scenario (Table 2). Currently, it has been shown that the use of simulators to educate healthcare practitioners is very effective in transferring knowledge to both trainees and practicing healthcare professionals. A wide variety of technologies including virtual reality, simulated patients, animal models, and static and interactive manikins have been shown to be effective teaching tools.[17] It is evidenced that SBME improves the clinical skills that directly improves the patient care and management such as in the settings of difficult obstetrical deliveries of shoulder dystocia, laparoscopic surgery, bronchoscopy, reduction of brachial palsy injury, neonatal hypoxic-ischemic encephalopathy among newborn infants.[18] Study in intensive care setting has shown that residents mastered in central venous catheter insertion with simulation technique are involved in fewer complications compared to the non experienced residents.[19]

Feedback is the most important characteristic of simulation training that have a direct impact on learning. It provides the ability to reflect on the educational experience to enhance learning.[10] and has a better potential of improving performance.[15] The present study showed most of the participants initially felt that the effective mode of feedback on simulation was through the verbal and written method. But after attending the workshop, the perception has changed and most of the participants felt that feedback is better served by video re-run the simulation and verbal feedback (Fig.1). These data clearly showed that the participants understand about the technique of 'debriefing' in clinical simulation. Debriefing is a special kind of feedback process effective for topics such as team training, crew resource management skills and multidisciplinary training.[10] As an experiential learning approach, debriefing facilitates participants' ability to relate their training experiences to daily

Table 3: Participants' rating with respect to achieving the desired goals about acquiring procedural skills through simulator (n=21)

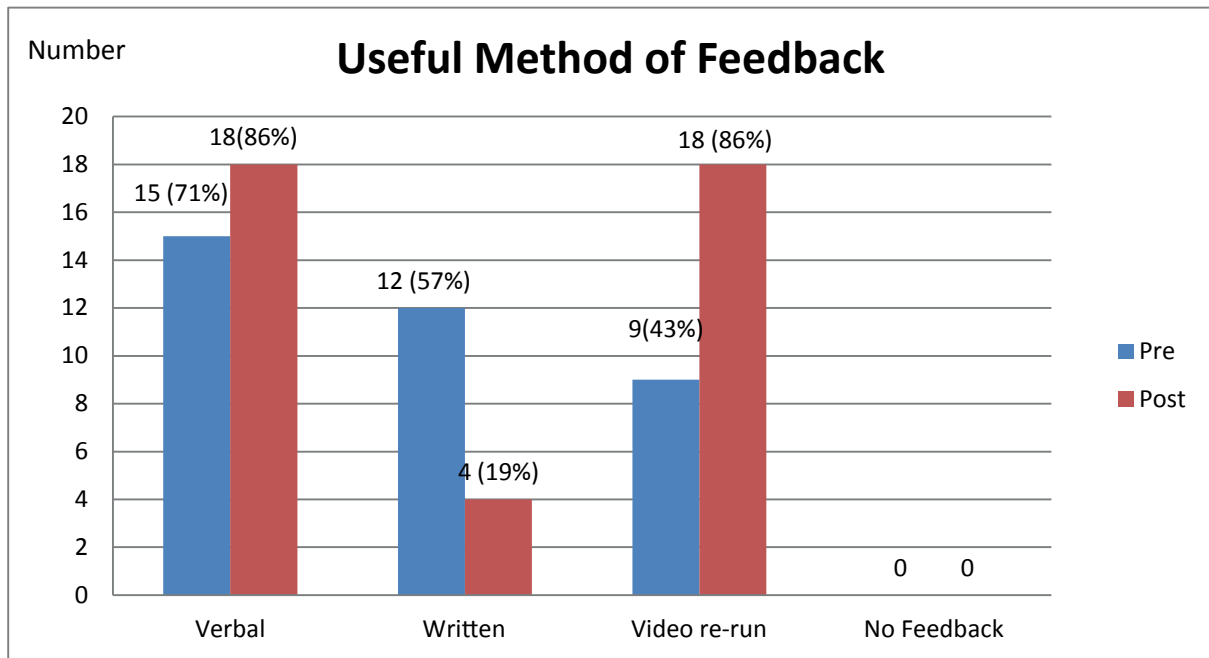|	Understanding of SBME	Scenario design & development	Debriefing technique	Confident in implementing SBME
Very good	10 (48%)	9 (43%)	8 (38%)	7 (33%)
Good	8 (38%)	9 (43%)	11 (52%)	8 (38%)
Average	3 (14%)	3 (14%)	2 (10%)	6 (29%)
Not good	0	0	0	0
Not good at all	0	0	0	0

Figure 1: Perception about the useful method of feedback (n=21)

practice. In simulation-based training, debriefing engages participants in reflective critique and discussion regarding their performance during simulation scenarios and this helps to improve targeted content and skills. Essential components of debriefing include description, analysis, and application.[20] Video playback is a useful debriefing method for adding perspective to simulation and allows participants to see how they performed rather than how they thought they performed and helps to reduce hindsight bias in assessment of the scenario.[10] Adequate preparation of faculty for debriefing in simulation based teaching method is important because debriefing has now been shown to be a vital learning component. Time to be spent in debriefing in relation to the hands-on component is not yet known. However, significant emphasis should be placed on the debriefing, from both time and quality perspectives.[21] The role of facilitator is very vital in focusing the discussion on the training scenario. Educational environment is one of the important determinants for an effective curriculum[22] and education system must respect diverse norms and values.[23] It is essential to create a comfortable environment where the participants are encouraged to self-correct.[20]

The overall workshop was found to achieve its objectives. Most of the participants agreed that the desired goals about acquiring procedural skills through simulator workshop has achieved in terms of understanding on SBME, scenario design &

development, debriefing technique (Table 3), and the participant are confident in implementing SBME in UKMMC.

Conclusion:

Tutors perception on SBME train-the-trainer workshop at UKM Medical Centre was found very effective in improving the knowledge and understanding of the participants. The debriefing was clearly understood by them and re-run video session was opined as a best method of feedback by the participants. Simulation provides learners the opportunity for deliberate practice. Medical schools should use simulation as an educational tool in order to increase the proficiency of learners.

Conflict of interest: None declared

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