

HOW TO IMPROVE STUDENT EDUCATION IN CARDIOLOGY? 13 ESSENTIAL ANSWERS THROUGH MEDICAL SIMULATION

Toma Cristian-Valentin¹, Toader Radu – Ionut¹, Coroceca Karina¹, Irina Ban²

¹Carol Davila University of Medicine and Pharmacy, Bucharest, ROMANIA

²Medical Coordinator of the Advanced Training Medical Simulation Center- LifeSim , Bucharest, ROMANIA

ABSTRACT

Aims: Is there a difference, from a clinical point of view, between a first year resident and a 4th year one, in the branch of Cardiology? If so, do we need to diminish it? And more importantly, do we have the tools? In this study it is aimed to evaluate medical simulation and its applicability in cardiology as an education method contributing to make students and residents more experienced and sufficient.

Methods: The descriptive, cross-sectional study based on a survey which was applied to the groups of students in Carol Davila' University of Medicine and Pharmacy (146) and residents (33 out of which 18 in the first two years and 15 in the last 3 years) was conducted between November 2014 and January 2015. Responses regarding evaluation of medical simulation as an education method were analyzed by using descriptive statistics including frequencies and percentages.

Results: The results showed that with the usage of medical simulation as an education method 128 (87.6 %) students would have felt more confident and learnt faster, while 113 (77.5%) students would have found studying more appealing. Furthermore 10 (68%) of residents in the 3rd, 4th, 5th year would have felt more experienced, if they actually encountered rare simulated pathologies; thus 16 (91%) of the residents in the 1st, 2nd year thought the risks would have decreased for patients.

Conclusion: Medical Simulation remains a necessity as an education method to improve practical skills of both students and residents in branch of cardiology.

Keywords: Cardiology, residency, simulation

INTRODUCTION

Medical simulation is a branch of simulation technology which can be applied in education and medical practice in various specialties. It may include human patient actors, educational documents with detailed animated simulation, procedural models and complex models with the possibility of creating complex scenarios requiring multidisciplinary collaboration. The main purpose of medical simulation is to train future medical practitioners in order to reduce errors deployed throughout the medical act from anamnesis to treatment and proper monitorization. Among the first uses of simulation in medicine the primitive mannequins were designed and implemented by anesthesiology physicians and gynecologists in order to diminish the number of errors. Due to technological limitations medical simulation was not launched as a useful tool for personal and profes-

sional development at that time. Later, with the exponential progress of technology medical simulation in field of cardiology has become available, standardized, accepted and certified.

Each year cardiovascular diseases (CVD) cause over 4 million deaths in Europe and 1.9 million deaths in the European Union (EU) accounting for 47% of all deaths in Europe and 40% in the EU (1). CVD is the main cause of death in women in all countries of Europe and is the main cause of death in men excluding 6 countries. According to the Institute of Medicine of USA between 44.000 and 98.000 deaths are recorded annually in US primarily due to simple medical errors which demonstrates the necessity of improving medical education applied to both students and residents (2). Therefore in this study it is aimed to evaluate medical simulation and its applicability in cardiology as an education method cont-

ributing to make students and residents more experienced and sufficient.

MATERIAL AND METHODS

The descriptive, cross-sectional study based on a survey which was applied to the groups of 146 students and 33 residents (out of which 18 in the first two years and 15 in the last 3 years) in Carol Davila University of Medicine and Pharmacy was conducted between November 2014 and January 2015. Out of all 179 participants 137 (76.5%) of them were females and 42 (23.4%) of them were males. Before completing the forms; the participants were informed about medical education through simulation by making a tour of the simulation center, seeing videos and using some of the high fidelity simulators that the center owns. The questions were closed with 2 possible answers – yes or no.

Out of 179 participants 130 (72.6%) of them saw videos or heard about medical simulation, 33 (18.5%) of them did not know about this possibility of training, 16 of them (9%) experienced medical simulation at different conferences or medical events. We included all students and residents of Carol Davila' University of Medicine and Pharmacy but excluded active volunteers in medical simulation centers.

Responses regarding evaluation of medical simulation as an education method were analyzed in (SPSS) 20.0 using descriptive statistics including frequencies and percentages.

RESULTS

According to the answers given in the surveys 128 (87.6%) out of 146 students would have felt more confident and 135 (92,4%) learned faster if they had received education including medical simulation, while 113 (77.3%) students would have found studying more appealing. Out of all 146 students 70 (47.9%) of them thought medical simulation is an economic method, thus 102 (69.8%) of them would have volunteered to work in a simulation center.

As for 18 residents in the 1st, 2nd year 16 (88.8%) of them considered that the risks for patients would decrease for patients. Additionally the responses to the questions evaluating medical simulation demonstrated out of 15 residents in their 3rd, 4th, 5th year, 10 (66.6%) of

them would have felt more experienced if the actually encountered rare simulated pathologies. Furthermore 11 (73.3%) residents in their 3rd, 4th, 5th year would have made less mistakes on patients if they practiced several times on simulated scenarios. Concerning the applicability of medical simulation, residents in their 3rd, 4th, 5th year 8 (53.3%) of them responded that they would have paid for medical simulation considering it as an actually economic method.

DISCUSSION

Medical Simulation has proven to assure significant cost decrease, higher efficiency of the allocated study time, new jobs/volunteering possibilities, automate processes and procedures, the ability to follow the evolution of the personal health records, the possibility of duplicative proceedings infinitely, the possibility of applying some complex scenarios with evaluation of medical activity in an “out of the box “ context (3, 4) . Today the method of hands-on, experiential learning and round the clock presence of indispensable experimented educators concentrate more and more on patient safety. The reality, however, assumes that making mistakes is part of the learning process leaving in fact the errors to remain a real risk for patient safety (5). With learning through simulation, students, residents, healthcare professionals and specialists who practice on a daily basis –all put together- have the opportunity to progress their skills using simulation technology – without or significantly reducing the risks for their patients (6). At the same time, practitioners gain confidence in their ability to perform clinical skills with real patients (7). The medical simulation, computer controlled equipment and teachers shall ensure that practitioners learn procedures and treatment protocols before using them on real patients. A simulation environment allows to learn and practice such procedures, repeating whenever necessary in order to correct mistakes, adjust their skills and optimize clinical outcomes (8). In addition, with medical simulation, students and residents can gain experience with different types of patients and cases (cloud sharing concept) that they do not actually meet during their rotations and shifts. This is particularly important for emergency management training because of the fact that patients with severe pathology cannot get a second chance.

Answering the classic 3 “W” – why, when, where – we reached 13 aspects which suggest that medical simulation and its applicability in cardiology shortens the necessary time to transform graduate students into a

better skilled young physician. The medical world needs to consider the issue of the real need of medical simulation because the problem of insufficiently skilled residents exist and it is part of our nowadays status quo: an onset of lack of physicians, lack of time in general, the need to gain lots of practical skills and of course, the continuous growing demands of our patients. The reason why this subject was not tackled yet at a reasonable level is time itself and the generation gap between the two entities: medical students and academicians. Due to the fact that education is a time consuming process, it does not allow the proper development of a medical simulation infrastructure, the formation of a group of instructors, administrative policies and regulation. In addition, time separates our two generations – us, the modern day students born in a fast moving world, surrounded by technology and academicians who try to adapt to it.

Other studies have shown that students think they can perform better and have higher retention rates than colleagues who use traditional methods. In the study carried out by Heitz et al. (9) a web-based survey was conducted and applied to Clerkship Directors in Emergency Medicine. The results of the study demonstrated consistency with our study claiming that a stepwise application of simulation in medical student education could optimize the ratio of students being successful.

We reached the conclusion that the students and young physicians would have liked to improve their practical skills by training on medical simulators. This brings advantages both to the medical students and the health system in each country. One of the tools that can change the classic way of studying with a modern, hands-on one might be medical simulation. In this way, the modern student will be more attracted and more motivated to study.

Acknowledgement

We would like to transmit special regards and utmost respect to the sponsor of the Advanced Medical Simulation Training Center – LifeSim on corporate social responsibility measures – Mr. Octavian Niculescu.

Ethics Committee Approval: This study was approved by Advanced Training Medical Simulation Center- LifeSim Ethics Committee.

Informed Consent: Written informed consent was obtained from the participants of this study.

Conflict of Interest: The authors declared no conflict of interest.

Financial Disclosure: The authors declared that this study received no financial support.

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