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# Health simulation masterclass in Morocco: First edition of training of trainers

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## Abstract:

**BACKGROUND:** The confluence of recent events has led to a notable increase in the use of health simulation. This work aimed to present and describe the first masterclass program in healthcare simulation dedicated to trainers at Rabat's Faculty of Medicine and Pharmacy with the close collaboration of Mohammad VI Foundation of Health and Sciences for its first edition in Morocco.

**MATERIALS AND METHODS:** This was an observational study. The participants in the training course were professors from the Faculty of Medicine and Pharmacy in Rabat as well as expert trainers from several Moroccan universities. The list of participants was identified by the head of their departments related to the Faculty of Medicine and Pharmacy of the University Mohammed V in Rabat. The program was developed by the training simulation experts supervised by the head of the Mohammad VI Foundation of Health and Sciences. Relevant aspects of our health simulation training were extracted after exploring the data NCBI sources and running the main following keywords: "Health simulation", "training", "simulation program", "emergency training", "technical skills", "soft skills" and "Medicine". First, we identified the different methods and approaches used in simulation-based medical training. Then, we set up our adapted simulation-based training program from February 5 to 8, 2024.

**RESULTS:** A total of 70 trainees participated in the training. Most of them were assistant professors (60.3%) and 19 were full professors (30.2%). The facilitators (n = 29) were professors and doctors who were national and international experts in health simulation; most came from Rabat (n = 19), followed by Casablanca (3). Evidence-based education, educational simulation, simulation for research and innovation and simulation and docimology were the main themes addressed. Simulation-based training programs mark a significant step forward in the development of medical education.

**CONCLUSION:** The pedagogical teaching skills of trainers need to be strengthened so that the transfer to learners is much more fluid and confident, such as this first edition of masterclass in Morocco organized by the Faculty of Medicine and Pharmacy in Rabat.

## Keywords:

Health, Morocco, simulation training, training of trainers

## Introduction

The confluence of several events such as health medical emergencies, important increase of health trainers, the lack of adequate training site, etc. has led to a notable increase in the use of health simulation. These factors include heightened attention to patient safety, the

need for an innovative training model not solely reliant on traditional learning, the growing demand for standardized training opportunities available on demand and the necessity to apply and refine skills in a controlled environment.<sup>[1]</sup> Simulation, as a learning method where one "pretends" to master techniques, dates to the earliest human practices. Training in the medical field based on simulation has been

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described as the artificial representation of a complex real-world process with enough accuracy to facilitate learning through immersion, reflection, feedback and practice, while avoiding the risks associated with a similar real-life experience.<sup>[2]</sup> Simulation began as an evidence-based educational technique and process when it became difficult for nurses to obtain clinical experience in a hospital setting.<sup>[3]</sup> In reaction to global government mandates for isolation and preventive measures, there has been a unanimous shift toward technology-driven education. Medical education adopts a dual strategy encompassing both learning and practical applications.<sup>[4]</sup>

Healthcare simulation is currently practiced in several countries. In Korea,<sup>[5]</sup> nursing schools have been incorporating simulation training into their programs for the past 10 years. This is to address the often-limited clinical practice experiences characterized by merely observing nursing activities as provided by instructors. Simulation training is also widely practiced in the United States, Europe and China.<sup>[6]</sup> In Morocco, in response to the request from the Human Resources Directorate, three Higher Institutes of Nursing and Technical Health Professions in the Kingdom have been equipped with a simulation laboratory, involving a substantial financial investment.<sup>[7]</sup> The study by Ouakhzan *et al.* conducted across three Higher Institutes of Nursing and Health Technical Professions demonstrates several challenges.<sup>[7]</sup> The study by Ouakhzan *et al.* conducted across three Higher Institutes of Nursing and Health Technical Professions demonstrates several challenges. These include issues such as trainers coping with student overstaffing, insufficient availability of certain managers at certain training centers, inadequate commitment from some trainers due to insufficient module hours, time-consuming techniques, insufficient hours allocated for trainers' development during their daily work and the lack of additional technical personnel hindering the effective functioning of simulation laboratories established by the Ministry of Health and Social Protection. Trainers at the three institutes have not yet mastered the steps involved in setting up a simulation training session and are struggling accordingly in this respect and only two institutes (Marrakech and Fez) out of the three included in the study are using the simulation laboratories set up for student training during the COVID-19 period. The Ministry of Higher Education has allocated significant financial resources to prepare the various Faculties of Medicine with simulation centers. The promotion of simulation in healthcare has thus become a national priority in Morocco. In addition, the number of recruits in Morocco is gradually increasing from year to year. This situation is increasing the demand for internships in hospitals and health centers. Trainees find themselves with restricted

access to patients to be able to practice theoretical courses, hence the interest in bridging this gap through simulation courses. Trainers who are expected to teach simulation courses need to be effectively educated in healthcare simulation to transfer their knowledge and meet the needs of students.

## Objective

This work aimed to present and describe the first masterclass program in healthcare simulation dedicated to trainers at Faculty of Medicine and Pharmacy in Rabat (FMPR) for its first edition in Morocco with the close collaboration of Mohammad VI Foundation of Health and Sciences.

## Materials and Methods

### Study design and setting

It is about an observational study to describe the masterclass program about the first edition in Morocco conducted in the simulation center of the FMPR.

### Study participants and sampling

The call of applicants was shared by the dean of the FMPR and with the director of the masterclass, head of the Mohammed VI foundation of Health and Sciences to different healthcare units to include the key actors to be trained in this first edition of training of trainers. The participants in the training course were professors from the FMPR as well as facilitators from several Moroccan universities and one facilitator from Tunisia. The list of participants was identified by the head of their departments related to the FMPR.

### Data collection tool and technique

Data for health simulation programs were compiled from various sources and datasets before organizing the training course. Relevant aspects of our health simulation training were extracted after exploring the data NCBI sources and running the main following keywords: "Health simulation", "training", "simulation program", "emergency training", "technical skills", "soft skills" and "Medicine". First, we identified the different methods and approaches used in simulation-based medical training. Then, we set up our adapted simulation-based training program at simulation center of the FMPR, from February 5 to 8, 2024. The program was developed by national experts and with the direct technical support of Mohammed VI Foundation of Health and Sciences.

### Ethical consideration

As this study did not include personal data; consequently, no committee opinion or informed consent was required.

## Results

This work has enabled us to draw up a national training program in medical simulation and a masterclass involving seventy professor’s participants at the FMPR. Figure 1 shows the distribution of trainer according to their level. Most of them were assistant professors (60.30%) and nineteen were full professors (30.20%).

The facilitators (n = 29) were professors and doctors who were national and international experts in health simulation. They came from University Hospitals in different regions of Morocco (Rabat, Casablanca, Marrakech, Agadir, Fez and Tangier) and one from Tunisia, as shown in Figure 2, to prepare participants with various pedagogical techniques to standardize trainees at distinct levels. Most of the trainers came from Rabat (19), followed by Casablanca (3). The first day focused on evidence-based simulation; the second day emphasized practical aspects, allowing participants to run scenarios, conduct debriefings and analyze debriefing sessions; the third day was dedicated to research and innovation in simulation; and finally, the fourth day focused on evaluation and assessment, as shown in Table 1, the summary of the simulation program (including different methods and scenarios). These are the different programs of the masterclass and the different methods and approaches covered over four consecutive days. Sessions were inter-reactive between participants and trainers.

Specialties and number of facilitators include Vascular Surgery(2), Forensic Medicine(2), Anesthesia-Reanimation(6), Orthopedics-Traumatology(1), Endocrinology(1), Simulation Trainer(2), General Surgery(2), Pediatric Surgery(4), Thoracic Surgery(1), Visceral and Digestive Surgery(1), Pediatric Neonatology(2), Visceral and Liver Surgery(1), Physical and Rehabilitation Medicine(1), General Practitioner(1),

Neurasthenia-Neuro-Resuscitation(1), Nephrology and Neurology(1).

## Discussion

This type of health simulation masterclass program was quoted as a first and special edition in Morocco based on serial new initiatives and innovative techniques.

A healthcare simulation program involves several approaches, methods and scenarios. During this masterclass, several topics were addressed such as simulation in healthcare: evidence based Education <<Brief>>, <<Supervise action>> and <<Debrief>> <<Soft skills>>; transversal non-technical skills; easy scenario writing; design a simulation center; knowledge synthesis; educational gamification; artificial intelligence in simulation; drawing up a simulation skills specification (pedagogical curriculum); scenarios simulation team (briefing, setting the scene, debriefing and debriefing of debriefing); the reform of medical studies in Morocco; e-simulation or tele-simulation; clinical reasoning and digital simulation; panel discussion: developing a research program involving simulation; inter-professional simulation and innovation in healthcare. The trainers came from various locations to transfer on their simulation expertise.

This diversity of specialties is an undeniable value that has enriched the program and the learning experience of participants. In the dynamic world of education and training, as part of the drive to improve the pedagogical and technical skills keep professors at the FMPR, this masterclass “Training of Trainers” (ToT) on healthcare simulation, which took place in the health simulation center of the FMPR in close collaboration with the Mohammed VI Foundation of Health and Sciences. This program implemented a mix of cognitive inputs, group work, exercises and discussions with experts, enhanced hands-on experience and implementation of simulation

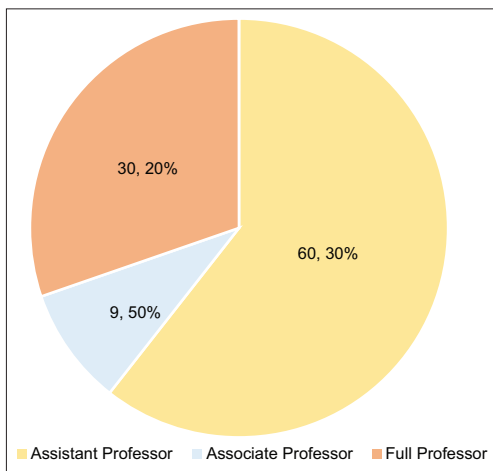


Figure 1: Distribution of the participants by their level of professor

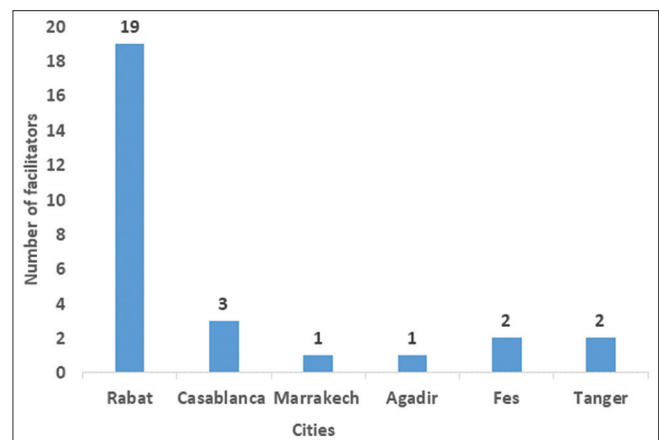


Figure 2: Origin of facilitators from different cities of Morocco

**Table 1: The four-days program and the various themes of the training of trainers in healthcare simulation organized at the Faculty of Medicine and Pharmacy in Rabat from February 05 to 08, 2024**

| Day | Theme titles                           | Interventions   |
|-----|--|---|
| 1   | Evidence Based Education               | Six interventions<br>Simulation in healthcare: Evidence Based Education<<Brief>>, <<Supervise action>>and<<Debrief>><br><<Soft skills>>Transversal non-technical skills<br>Easy scenario writing<br>Design a simulation center<br>Knowledge synthesis   |
| 2   | Educational simulation                 | Three interventions:<br>Educational gamification<br>Artificial intelligence in simulation<br>Drawing up a simulation skills specification (pedagogical curriculum)<br>Three scenarios: three simulation team (Briefing, Setting the scene, Debriefing, Debriefing debriefing)                             |
| 3   | Simulation for research and innovation | Seven interventions:<br>The reform of medical studies in Morocco<br>E-simulation or tele simulation<br>Clinical reasoning and digital simulation panel discussion: Developing a research program involving simulation<br>Inter-professional simulation<br>Innovation in healthcare<br>Knowledge synthesis |
| 4   | Simulation and docimology              | Organizes an Objective Structured Clinical Examination in a pedagogical simulation environment  |

sessions in the training sites. This masterclass experience provided us with an in depth-understanding of the basic principles of healthcare simulation. The methods and approaches used were based on scenario design for healthcare simulation and several others described above.

The expected pedagogical competency was to develop a simulation-based learning program that meets academic training standards. Simulation-based training programs at the FMPR mark a milestone in the development of medical education. By adopting this innovative approach, our health professionals will be better trained and well prepared and more competent. Also, this healthcare simulation training has offered participants numerous benefits: it ensures self-control, patient safety, teamwork, reduced emergency management and better communication.

These different methods, approaches and scenarios used in this training were also covered in the studies of Ayaz and Ismail<sup>[1]</sup> and Seam *et al.*<sup>[8]</sup> The training improved the knowledge and skills of the participants,

as demonstrated by Egenberg *et al.*<sup>[9]</sup> in its study at two hospitals in northern Tanzania; participants recommended the continuation of simulation training.<sup>[9]</sup> During the implementation of this training of trainers, difficulties related to organization and mobilization were encountered, comparable to the problems revealed by Binotti *et al.*<sup>[2]</sup> in their study in Italy; a survey conducted in 2019 identified several obstacles to setting up a simulation program for residents, such as lack of experts, lack of support from the school principal, lack of organization in planning simulation courses and lack of teaching materials.<sup>[2]</sup>

At global concern, health simulation, while important, faces several obstacles and challenges. Its use remains unevenly distributed around the world due to misconceptions about its availability, cost, complexity and lack of evidence of its consistency and validity.<sup>[1]</sup> Developing countries are still finding it difficult to introduce it across the board.<sup>[10]</sup> Yet, evidence for the transition from medical training to simulation has grown over the past 2 decades due to the increasing emphasis on patient safety rather than bedside training.<sup>[11]</sup> Meanwhile, during the SARS-CoV-2 pandemic, interaction with patients was limited for students and residents to prevent the spread of the disease.<sup>[11]</sup> As the Zucco *et al.*<sup>[12]</sup> study demonstrated, *in situ* simulation training for the health staff was beneficial in countering the major impact of the COVID-19 pandemic on care delivery.

### Limitations and suggestions

Within this masterclass we faced the fact that many participants were not involved to the simulation course as we were not able to include more. In addition, the time devoted to this study was limited to develop more pedagogical methods and approaches in healthcare simulation.

In the light of our study, we suggest a large-scale mobilization of national and international human, material and financial resources for the next edition of this training course, which has demonstrated its beneficial aspect in improving pedagogical knowledge and skills. We also call for this initiative to be extended to several sites across Morocco to provide better medical training for the well-being of the population.

### Conclusion

Traditional medical education does not guarantee that learners are fully trained to provide better care; simulation-based medical education is proving to be crucial in remedying this problem. In addition, the pedagogical training skills of trainers need to be strengthened so that the transfer to learners is much more fluid and confident, such as this first edition



of masterclass in Morocco organized by the FMPPR with the support of Mohammed VI Foundation of Health and Sciences.

Finally, this first edition of masterclass is a real interest case study that can be used in all medical faculties, health institutes and paramedical training schools in Morocco for better medical education.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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