

A Curriculum Using Simulation Models to Teach Gynecology and Obstetrics to Trainees

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Key words: 8-year Medical Program; Clinical Medical Students; Education; Medical Simulation Model; Obstetrics and Gynecology

INTRODUCTION

With the development of science and technology, great changes have taken place in medical education, making it increasingly complicated and diversified. For medical students who have just finished basic medicine courses and are preparing for their hospital internships, it is difficult to gain experience performing direct physical examinations on patients. Currently, residents' clinical skills are assessed very strictly; simply taking notes and reciting facts will not suffice. Because considerable attention is being paid to medical students' clinical skills on a national level, it is reasonable to conclude that practical abilities are becoming increasingly significant in medical education. In addition to the strained relationship between doctors and patients in China, patients' awareness and defense of their rights are stronger than ever; furthermore, given the expansion of medical colleges in China, medical students' education has become more complex, and their opportunities to participate in surgery have decreased considerably. The specific nature of obstetrical and gynecological diseases, the complex anatomical structures, and some traditional Chinese concepts combine to make gynecology and obstetrics education particularly challenging. Residents are busy with their inpatients, and it is often awkward to have to teach in the hospital room or the outpatient department while expectant parents are awaiting the birth of their child. In such situations, simulation models play an important role. Medical simulation teaching uses various methods to simulate the work of clinical medicine in a way that provides learners a risk-free environment in which to gain clinical knowledge and skills. Compared with other medical teaching methods, simulation is noninvasive, convenient, repeatable,

and inexpensive. It is likely to become a commonly used teaching method;^[1] therefore, for residents and medical students at various stages, practice with medical simulation models and evaluations of training on those models are very important. In medical education, medical simulation models and simulation teaching have a broad range of applications.

SURVEY FOR MEDICAL SIMULATION MODELS

A teaching curriculum was composed of four sessions using medical simulation models to teach the basic principles of physical examinations and physiology in obstetrics and gynecology of Peking Union Medical College Hospital. All participants were preclinical medical students, who were the class of 2018, 5th-year medical students in the 8-year clinical medicine program at Peking Union Medical College. The teaching content for both groups included the mechanism of labor, four maneuvers, family planning, gynecological examination, and fetal heart monitoring. All of the students ($n = 80$, 100%) thought that the simulation model courses were extremely helpful for their careers, were worthwhile, and should be recommended. They thought that the course hours should be increased, and

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Received: 09-01-2017 **Edited by:** Xin Chen

How to cite this article: Ren HY, Sun ZJ, Zhu L, Lang JH, Pan H, Wu X. A Curriculum Using Simulation Models to Teach Gynecology and Obstetrics to Trainees. Chin Med J 2017;130:997-1000.

Access this article online

Quick Response Code:



Website:
www.cmj.org

DOI:
10.4103/0366-6999.204116

they hoped to continue to participate in the course. Forty percent of the students thought that group learning was the best format for simulation model instruction. More than 40% of the students thought that simulation training could enhance their knowledge and improve their comfort and confidence when interacting with patients; furthermore, the training improved their practical skills. The students reported that for the obstetrics and gynecology rotation, simulation training would be most beneficial for teaching gynecological examinations (100%), obstetric examinations and fetal heart monitoring (77.5%), basic family planning procedures (56.5%), and obstetrical delivery (42.5%). The questionnaires investigating the medical simulation model teaching course are shown in Table 1.

ADVANTAGES OF MEDICAL SIMULATION MODELS

The 8-year medical education system in China is a new implementation of a longer program in response to the high level of international medical education standards and requirements combined with the characteristics of medical education in China. The existing basic framework of the 8-year medical education system was first established at Peking Union Medical College. Most of them obtain a medical doctor (MD) degree when they show professional capability in both research and practice and have successfully defended their MD theses orally after 8 years of academic and practical training.^[2] The goal of the system is to prepare innovative medical professionals who respond to the development of the medical field and are specialized and knowledgeable.^[3]

With educational reforms, an increasing number of educators have found that the traditional educational approaches such as a cramming method of teaching, bedside-based learning, and problem-based learning models that emphasize the study of medical theory, basic knowledge, and clinical thinking fail to cultivate students' skills in basic clinical procedures. In recent years, medical colleges, both at home and abroad, have begun to use a simulation model that focuses on simulated examinations of a standardized patient (SP) and have developed courses that combine the teaching model with multimedia and simulation models. Simulators can be classified as model-based, computer-based, or integrated procedure simulators.^[4] Whether the examination is gynecological or obstetrical, patients need to take off their pants and expose their perinea because of the particularities of obstetrics and gynecology treatments. Patients may feel uncomfortable or may experience pain during vaginal examinations. Most patients refuse to be examined while surrounded or watched by interns and trainee students, which reduces the clinical opportunities available to medical students. To avoid any possible violation of patient privacy, students are not permitted to be involved in any patient care; nonetheless, they are required to undergo an orientation before they begin clinical practice. The simulation model helps medical students gain clinical experience and understand the development and clinical manifestations of diseases in particular patients. Simulation serves to provide students with valuable experience in areas where opportunities are limited but gaining technical skills is important. Successful models have been developed for shoulder dystocia,

Table 1: The questionnaires investigating the medical simulation model teaching course (n = 80)

Questions	Answers	Number of students, n (%)
Which of the following courses would benefit most from a simulation teaching model?	Obstetrical delivery model	34 (42.5)
	Basic family planning procedures model	45 (56.3)
	Gynecological examination model	80 (100.0)
	Obstetrical examination and fetal heart monitoring model	62 (77.5)
What percentage of simulation model usage do you think is appropriate in medical teaching?	10%	0 (0.0)
	20%	28 (35.0)
	30%	31 (38.8)
	The more, the better	20 (25.0)
Is it important to use a simulation model in gynecology and obstetrics teaching?	No	0 (0.0)
	It does not matter to me	0 (0.0)
	Increased class time should be available for simulation training because it helps the students	80 (100.0)
Which of the following do you think is the most suitable learning arrangement for simulation model teaching?	Group	40 (50.0)
	Classroom presentation	0 (0.0)
	Autonomous learning and open classroom	22 (27.5)
	A combination of the above	31 (38.8)
Which of the following do you think is the most helpful outcome of this course for you?	A more profound understanding of the content	46 (57.5)
	The ability to interact with the patient with greater confidence	42 (52.5)
	Improved practice ability	54 (67.5)
	Increased interest in learning	20 (25.0)
Do you wish to continue participating in this program?	Yes	80 (100.0)
	No	0 (0.0)

vaginal breech delivery, obstetric emergencies, operative hysteroscopy, and laparoscopy.^[5]

The above survey showed that all the students ($n = 80$, 100%) hoped to continue to participate in the simulation model curriculum, especially when learning basic gynecological examination procedures. This is in the preliminary stage of developing a simulation teaching model that is easy for students to understand, suitable for developing professional characteristics, helps students improve their clinical procedural skills and adapt to clinical environments, and is suitable for teaching and practicing gynecology and obstetrics. According to a study by Baldwin and Edelman,^[6] a model for estimating uterine size during early pregnancy that obstetrics and gynecology providers worldwide could use for a variety of clinical applications would improve safety in low-resource settings. The purpose of the simulation model training is to provide opportunities for students to develop examination skills, to avoid patients' embarrassment and disputes between doctors and patients, and to cultivate creative medical practitioners who have skills in clinical procedures, analysis, and thinking.

Many scholars have reported that the use of gynecology and obstetrics simulation models, such as pelvic models of adult or prepubertal females, vaginal hysterectomy models, vaginal delivery simulators, and cesarean section simulators, improves students' and residents' practical clinical skills.^[7-10] Furthermore, simulation models for hysteroscopy and laparoscopy are widely used in the education of senior residents. The simulation model also makes class information more vivid and visible and profoundly enhances understanding, thus improving clinical practice skills and enhancing skills on all types of examinations. Therefore, obstetrics and gynecology simulation models can present the clinical features of obstetrical and gynecological diseases for interns and doctors in training.

The simulation model has recently attracted increasing attention. Most medical universities have begun to develop a variety of different simulation models. Simulation model curricula have been developed primarily to ensure the appropriate and feasible use of models in gynecology and obstetrics teaching, that is, to make abstract theory visible and accessible, to make teaching more lively and interesting, to motivate students' interest in learning, to improve clinical practical skills, and to perfect the evaluation system by providing relevant theoretical knowledge throughout the course of practice. To better explain the abstract features of gynecological examinations, spontaneous vaginal delivery, and shoulder dystocia to trainees and interns who have completed basic medical coursework for obstetrics and gynecology, the simulation course content should focus primarily on relevant clinical examinations and procedures. The simulation model course deepened the students' impressions and helped educators better address the objectives of gynecology and obstetrics teaching. Residents' education is challenged by work-hour limitations and reduced numbers of patients available for teaching.

All types of simulation models and SPs will appear on the observed structured clinical examination; therefore, the simulation course should focus primarily on procedures. The use of simulation models avoids patient discomfort and doctor-patient conflict; furthermore, it allows the repeated performance of procedures as teachers provide instructions. Medical colleges can establish simulation model courses for different levels and can perfect the training evaluation system to improve the clinical skills of medical students and residents.

With various teaching models available in medical colleges, the advantage of simulation models over the traditional teaching model is apparent. The use of simulation models is necessary in medical education, especially when the particularities of obstetrics and gynecology study are considered. First, procedures can be repeated on the model. Medical students can continue until they are proficient without prolonged patient exposure that can lead to distrust and patient loss. Second, the full use of model resources and the vigorous development of a simulation model-based teaching curriculum can shorten the time from theory to practice for medical students. By strengthening their basic medical knowledge and enhancing their clinical skills as part of a lively simulation model course, medical students will develop a deeper understanding of basic medical concepts and the features of clinical medicine. To achieve the ultimate goal of education, we need to combine the model with clinical operation.

For male trainee and internship students, the obstetrics and gynecology rotation can be the worst experience in their clerkship. Some male students may even attempt to escape the obstetrics and gynecology rotation because of their discomfort with bedside learning and their refusal to watch patient procedures. The simulation model course can avoid the above problems. However, the models are not real patients; the use of models does neither allow students to experience a real patient's psychological and physical discomfort nor provide opportunities for patient communication. In the hospital, we face real patients with many individual differences. Simulation model coursework cannot help students communicate better with patients or develop the capacity to address clinical strain. Therefore, the simulation model cannot take the place of a variety of teaching models. During the education process, educators should use a variety of teaching modes; particularly, students should interact with SPs to gain doctor-patient communication skills and develop their clinical strain capacity.

LIMITATION OF SIMULATION MODEL TRAINING COURSE

According to the above survey, the simulation model training course can combine multimedia supplementary learning opportunities, thus allowing students to approach the task and gain a deeper impression of the procedure before the course. However, some limitations in the curriculum should be addressed as follows: (1) enhancing doctor-patient

communication skills by creating a fully functional and humanizing model; (2) establishing specialized training rooms for obstetrics and gynecology simulation models, expanding the number and types of models, and establishing precontract and management systems; (3) developing model training courses at different levels for trainees, internships, and residents, with attention to the practicality and fun of the courses; and (4) developing standardized assessment systems for simulation model training and constantly improving the curriculum and teacher training.

All types of simulation models have been used at medical colleges in China. In the tense doctor patient environment, the simulation model has obvious advantages for medical education and will improve the quality of teaching and the students' practical clinical skills. Our study provides a preliminary model for a simulation teaching experience. The course needs further extension of teaching content, a fine tuning of teaching plans and evaluations of model teaching for students of different levels. Such improvements would make clinical procedures more standardized and scientific for preclinical students and residents; furthermore, they would represent great strides toward cultivating medical talent through the development of a simulation model training curriculum and would be in line with the international standards.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Wan XH, Yao X, Qing P. Development of modern simulation teaching and its effect on medical education. *Chin J Evid Based Med* 2008;8:413-5. doi: 10.3969/j.issn.1672-2531.2008.06.014.
2. Xu X, Wang Z, Pan H, Yang P, Yu J. One-week experience in the general surgery outpatient clinic for preclinical medical students. *J Surg Educ* 2012;69:599-604. doi: 10.1016/j.jsurg.2012.05.001.
3. Geng Q. The Cultivation of Innovative Ability for Eight-year Program Medical Students. *Hosp Manage Forum* 2014;3:41-2.
4. Michael M, Abboudi H, Ker J, Shamim Khan M, Dasgupta P, Ahmed K. Performance of technology-driven simulators for medical students – A systematic review. *J Surg Res* 2014;192:531-43. doi: 10.1016/j.jss.2014.06.043.
5. Loveless MB, Finkenzeller D, Ibrahim S, Satin AJ. A simulation program for teaching obstetrics and gynecology residents the pediatric gynecology examination and procedures. *J Pediatr Adolesc Gynecol* 2011;24:127-36. doi: 10.1016/j.jpjag.2010.12.003.
6. Baldwin MK, Edelman AB. Development of a training model for estimation of uterine size in early pregnancy. *Int J Gynaecol Obstet* 2014;127:216-7. doi: 10.1016/j.ijgo.2014.05.006.
7. Greer JA, Segal S, Salva CR, Arya LA. Development and validation of simulation training for vaginal hysterectomy. *J Minim Invasive Gynecol* 2014;21:74-82. doi: 10.1016/j.jmig.2013.06.006.
8. Nelissen E, Ersdal H, Mduma E, Evjen-Olsen B, Broerse J, van Roosmalen J, *et al.* Helping Mothers Survive Bleeding After Birth: Retention of knowledge, skills, and confidence nine months after obstetric simulation-based training. *BMC Pregnancy Childbirth* 2015;15:190. doi: 10.1186/s12884-015-0612-2.
9. Damle LF, Tefera E, McAfee J, Loyd MK, Jackson AM, Auguste TC, *et al.* Pediatric and adolescent gynecology education through simulation (PAGES): Development and evaluation of a simulation curriculum. *J Pediatr Adolesc Gynecol* 2015;28:186-91. doi: 10.1016/j.jpjag.2014.07.008.
10. Vellanki VS, Gillellamudi SB. Teaching surgical skills in obstetrics using a cesarean section simulator-bringing simulation to life. *Adv Med Educ Pract* 2010;1:85-8. doi: 10.2147/AMEP.S14807.