

## Original Research Article

# Teaching surgical skills in obstetrics and gynaecology using cadaver simulation: an innovative teaching learning method

Nandkishor B. Gaikwad<sup>1</sup>, Pradnya Bhalerao<sup>2\*</sup>, Tabssum Maner<sup>1</sup>, Vidya D. Mule<sup>1</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Government Medical College, Miraj, Sangli, Maharashtra, India

<sup>2</sup>Department of Anesthesiology, Government Medical College, Miraj, Sangli, Maharashtra, India

**Received:** 23 July 2017

**Accepted:** 21 August 2017

### \*Correspondence:

Dr. Pradnya Bhalerao,

E-mail: [dr.pradnyabhalerao@gmail.com](mailto:dr.pradnyabhalerao@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Transfer of knowledge from teachers to students traditionally occurs in one direction using blackboards, overhead projectors, power-point presentations and lectures. It has many disadvantages. The main challenge in medical education is to teach surgical skills. For the learning of critical interventions, simulation-based training is structured so that the acquisition of new skills does not harm patients. Thus, the objective of this study was to enhance and improve procedural skills of resident doctors of Obstetrics and Gynaecology department of Government Medical College, Miraj using cadaver simulation in doing abdominal hysterectomy.

**Methods:** Second year resident doctors from Obstetrics and Gynaecology department of GMC, Miraj who had completed their first year successfully in terms of basic orientation regarding surgical procedures were taken for study purpose. They were divided in two groups randomly. The first group underwent conventional method of teaching to learn the abdominal hysterectomy procedure and underwent feedback from them regarding the conventional teaching learning method. Then they were allowed to perform the procedure on a live patient and their performance of procedural skill was assessed by DOPS. (Direct observation of procedural skills). The second group underwent innovative method of use of cadaver simulation for the abdominal hysterectomy procedure and feedback on the same. They were allowed to perform the procedure on a live patient and their performance of procedural skill was assessed by DOPS. (Direct observation of procedural skills). All data was collected, analysed and processed to study the outcome of research project.

**Results:** In group B, all resident were fully satisfied with newer method of teaching and learning for abdominal hysterectomy as surgical procedure. As far as, the advantages and disadvantages of teaching and learning are concerned, all residents pointed out large number of disadvantages in the conventional method. Evaluation of the surgical procedural skill was done by DOPS by senior faculty members of the department as per the questionnaire which showed good performance from group B.

**Conclusions:** The benefit of simulation based medical education (SBME) is that it offers both learners and patients a safe environment for practice and error. In addition, SBME can provide a learning cycle of debriefing and feedback for learners as well as assessment and certification for procedures and competency.

**Keywords:** Cadaver simulation, Surgical skills

## INTRODUCTION

Transfer of knowledge from teachers to students traditionally occurs in one direction using blackboards,

overhead projectors, power-point presentations and lectures. It has many disadvantages. The main challenge is to teach surgical skills in medical education. Historically, residents have learned their skills in the

opportunistic, unstructured environment of the emergency department.<sup>1</sup> The mantra "see one, do one, teach one" is often repeated to residents throughout their training.<sup>2</sup> Although senior staff provide supervision, inevitably, errors do occur. Learning new procedures in daily practice is hazardous and difficult to achieve. With the pressure of high standard of medical service, improvement in quality of healthcare services rendered, service throughput and reduced training times for surgical trainees, there is increasingly limited training opportunities for postgraduate trainees.<sup>3</sup> A training experience with cadaver surgery could improve the course and outcome of surgery on patients.<sup>4</sup> For the learning of critical interventions, simulation-based training is structured so that the acquisition of new skills does not harm patients. Simulation-based medical education offers a trainee-centered environment that allows the educator to provide full attention to an individual learner's needs at an appropriate pace. Simulation based medical education uses high fidelity manikins to simulate virtually any scenario and thus involves practical application of knowledge. It has revolutionized learning, making it more active and enjoyable. Simulation is a practical and safe approach to the acquisition and maintenance of task-oriented and behavioural skills across the spectrum of medical specialties, including obstetrics and gynecology.<sup>5</sup> In the last 10 years, technological advances have allowed for a wider availability and greater realism of simulation, and this has encouraged a great expansion in its use.<sup>6</sup>

Thus the primary objective of this study is to enhance and improve procedural skills of resident doctors in gynaecology using cadaver simulation.

**METHODS**

Second year resident doctors from the department of Obstetrics and Gynaecology from Government Medical College, Miraj who had completed their first year successfully in terms of basic orientation regarding

surgical procedures were considered for study purpose. They were divided in two groups using computerised randomisation.

The first group underwent conventional method of teaching to learn the abdominal hysterectomy procedure and feedback regarding the conventional teaching learning method was taken. In this method, all students were explained the whole procedure of abdominal hysterectomy including surgical anatomy. Then they were allowed to observe the procedure in operation theatre. In the next step, they were allowed to assist the abdominal hysterectomy procedure. Over this period, they were allowed to ask any query regarding the procedure and were appropriately answered. Then they were allowed to perform the procedure on a live patient under guidance and their performance of procedural skill was assessed by DOPS. (Direct observation of procedural skills).

In the second group in addition to the conventional method, innovative method using cadaveric simulation for the abdominal hysterectomy procedure was used and feedback from them regarding this teaching method was taken. They too performed the procedure on a live patient and their performance was assessed by DOPS. (Direct observation of procedural skills).

All data was collected, analysed and processed to study the outcome of research project.

**RESULTS**

Total eight residents from department of Obstetrics and Gynaecology were participated in the current research project. They were randomly divided in 2 groups i.e. Group-A and Group-B. Group A underwent conventional method of teaching and learning as described while the second group B underwent newer method of teaching and learning of using cadavers. The feedback for both the methods of teaching and learning were analysed.

**Table 1: Observations.**

Group A	Group B
All residents required development in all domains of surgical procedural skill as mentioned in questionnaire	All residents performed the procedure up to satisfactory standard in all domains of surgical procedural skill as mentioned in questionnaire
As per global summary for evaluation 50% residents performed it up to level 1 (i.e. Unable to perform the procedure under supervision) while 50 % residents performed it up to level 2 (i.e. Able to perform the procedure under supervision)	As per global summary for evaluation 50% residents performed it up to level 2 (i.e. Able to perform the procedure under supervision) while 50 % residents performed it up to level 3 (i.e. Able to perform the procedure with minimum supervision.)

In group A, all resident was not fully satisfied with current conventional method of teaching and learning for

abdominal hysterectomy as surgical procedure. Only 25 % residents thought that the conventional method of

teaching and learning for abdominal hysterectomy would improve their surgical skill while 75% residents thought that conventional method of teaching and learning for abdominal hysterectomy would not be helpful for improvement of their surgical skill. As far as, the advantages and disadvantages of teaching and learning are concerned, all residents pointed out large number of disadvantages on conventional method of teaching and learning for abdominal hysterectomy (e.g. not able to understand the clear anatomy or surgical procedure of abdominal hysterectomy), thus indicating the low efficacy of conventional method.

In group B, all resident was fully satisfied with newer method of teaching and learning for abdominal

hysterectomy as surgical procedure using cadaver simulation. All residents thought that the newer method of teaching and learning for abdominal hysterectomy using cadaveric simulation would improve their surgical skill. As far as, the advantages and disadvantages are concerned, all residents pointed out large number of advantages on newer method of teaching and learning for abdominal hysterectomy (e.g. able to understand the clear anatomy or surgical procedure of abdominal hysterectomy), thus indicating the high efficacy of newer method. Evaluation of the surgical procedural skill was done by DOPS by senior faculty members of the department as per the questionnaire.

**Table 2: DOPS (direct observation of procedural skills) assessment.**

Rate the domains using the following scale: N = Not observed or not appropriate, D = Development required, S = Satisfactory standard for completion of procedure (no prompting or intervention required)	
Domain	Rating (N/D/S)
1. Describes indications, anatomy, procedure and complications to assessor	
2. Obtains consent, after explaining procedure and possible complications to patient	
3. Prepares for procedure according to an agreed protocol	
4. Demonstrates good asepsis and safe use of instruments and sharps	
5. Performs the technical aspects in line with the guidance notes	
6. Deals with any unexpected event or seeks help when appropriate	
7. Completes required documentation (written or dictated)	
8. Communicates clearly with patient and staff throughout the procedure	
9. Demonstrates professional behavior throughout the procedure	
Global summary	
After summarizing the discussion with the trainee in the box above, please complete the level at which the procedure was performed on this occasion	Tick
Level 0 Insufficient evidence observed to support a summary judgment	
Level 1 Unable to perform the procedure under supervision	
Level 2 Able to perform the procedure under supervision	
Level 3 Able to perform the procedure with minimum supervision (needed occasional help)	
Level 4 Competent to perform the procedure unsupervised (could deal with any complication that may arise)	

## DISCUSSION

Clinical simulation is one of the procedures used in health-care education that is performed in a situation that mimics a clinical setting in order to learn the technical skills and competency required for healthcare. Desire for patient safety and quality in patient care as the driving force is accelerating the development of simulation based medical education (SBME) around the world. The main objective of SBME is focused on obtaining clinical skills belonging to the psychomotor domain. Furthermore, it can be used for not only education of the cognitive domain, such as knowledge, but also education of the affective domain, for example, communication training by the session with simulated patients.<sup>7,8</sup> Simulation

training is based on active and adult learning theories. Dale et al. demonstrated that the learning curve of active learning is higher than that of passive learning and that learners can generally remember 90% of what they do by active learning (Dale’s cone of experience). The benefit of SBME is that simulation training offers both learners and patients a safe environment for practice and error. In addition, SBME can provide a learning cycle of debriefing and feedback for learners as well as assessment and certification for procedures and competency.<sup>9</sup> In our study we found a definite better learning outcome in students who underwent training on cadavers. Similar results were seen by Nestle D et al.<sup>10</sup>

This was a pilot study. Thus, the limitation was that the number of students enrolled was only eight. We however

propose to continue the study on the future batches of resident doctors at our hospital.

## ACKNOWLEDGEMENTS

Authors would like to thank Government Medical College, Miraj for study support.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Hayden SR, Panacek EA. Procedural competency in emergency medicine: the current range of resident experience. *Acad Emerg Med.* 1999;6:728-35.
2. Vozenilek J, Huff JS, Reznick M, Gordon JA. See one, do one, teach one: advanced technology in medical education. *Academic Emergency Medicine.* 2004;11(11):1149-54.
3. Bisson DL, Hyde JP, Mears JE. Assessing practical skills in obstetrics and gynaecology: educational issues and practical implications. *The Obstet Gynaecol.* 2006;8:107-12.
4. Tjalma WA, Degueudre M, Van Herendaal B, D'Herde K, Weyers S. Postgraduate cadaver surgery: an educational course which aims at improving surgical skills. *Facts, views and vision in ObGyn.* 2013;5(1):61.
5. Gardner R, Raemer DB. Simulation in obstetrics and gynecology. *Obstetrics and Gynecology Clinics of North America.* 2008;35(1):97-127.
6. Fox R, Walker J, Draycott T. Medical simulation for professional development-science and practice. *BJOG.* 2011;118(3):1-4.
7. Gaba DM. The future vision of simulation in health care. *Qual Saf Health Care.* 2004;13(1):i2-10.
8. Bradley P. The history of simulation in medical education and possible future directions. *Med Edu C.* 2006;40:254-62.
9. Schuwirth LW, van der Vleuten CP. The use of clinical simulations in assessment. *Med Educ.* 2003;37(1):65-71.
10. Nestel D, Kneebone R, Black S. Simulated patients and the development of procedural and operative skills. *Med Teach.* 2006;28:390-1.

**Cite this article as:** Gaikwad NB, Bhalerao P, Maner T, Mule VD. Teaching surgical skills in obstetrics and gynaecology using cadaver simulation: an innovative teaching learning method. *Int J Res Med Sci* 2017;5:4411-4.