

Effectiveness of operation theater classes in learning operative procedure

Syeda Ayesha Hashmi, Nazish Zia, Samia Asma, Syeda Fatima Hashmi, Muhammad Yasir Tarar

Abstract

Objectives: To study how effective are the operation theatre clinical rotations among undergraduate medical students in learning different operative procedure and theatre protocols and to compare the operative learning between different surgical specialties.

Methodology: It was a cross-sectional study carried out in 11 different medical institutes and teaching hospitals of Lahore. 7 of them were public medical institute and 4 were private. The population was out going final year and house officers out of which we took sample of 100 students via convenient random sampling. An anonymous structured questionnaire was used. The effectiveness of clinical rotation in OR (OT classes) was assessed by following parameters: hours dedicated per day to OR classes, attendance in following classes, ways of teaching operative procedure being performed on that day, surgeon's interest in taking OT class, availability of space around operating table to observe procedure being performed, procedures learnt, aseptic measures being taught, sterilization techniques learnt, and help in paper solving. Data analysis was done on SPSS

Results: 51% of the population were females and 49% were males. 78% of them were house officers and 22% were final year students. 34% of population has allotted 2 hour for theatre rotation, 24% has 1 allotted hour and 20% has 3 or 4 allotted hours each. 60% has OR rotation twice a week. 20% has thrice a week and 15% has rotation once a week. 40% strongly agree that there is no availability of space on OR table. While 76% has 4 or more people allotted per table. 46% agree that the operating surgeon took a class on what he was going to perform. 60% were not being able to visualize the procedure properly or to understanding and memorizing surgical procedure after rotation. Only 18% agree that the rotation help in paper. 57.5% has the most effective learning in general surgery or 18% considered gynae and E.N.T or as most effective learning place. Reason for effective learning in 76% of cases is surgeon explaining the surgical procedure with 12% cases of effective learning through video training and e-learning each.

Conclusions: Theatre rotations are not very helpful in learning procedure due to non availability of space around the operating table, more number of students per table and no pre procedure briefing. Theatre with video training and e learning has more effective learning.

Keywords: operating theatre rotation, surgical rotations, video assisted learning, hand hygiene, e- learning

Introduction:

Surgery is a set of miraculous skills, meticulous techniques and unparalleled clinical competency which requires mastering an extensive set of details and subcomponents related to the procedure being performed. An explicit number of skills are needed to achieve high standards

in surgery, including sound base of anatomical knowledge, perfection on decision-making, impressive communication skills, and those, that are more difficult to access, such as practical technique and hand hygiene. Such skills can only be mastered by improvised teaching and surgical experience.¹ Clinical training rotations helps a

Received:
4th January 2017

Accepted:
23rd October 2017

Fatima Jinnah Medical
University, Lahore.
SA Hashmi
N Zia
S Asma

Services Institute of
Medical Sciences, Lahore.
MY Tarar
SF Hashmi

Correspondence:
Dr Syeda Ayesha Hashmi,
Fatima Jinnah Medical
College, WMO THQ
Chunian, Distt. Kasur
Cell:
Email: drayeshahashmi1@
gmail.com

medical student to attain a certain level of skills to perform/assist a procedure competently and independently in a clinical setting. All around the world there is a stipulated requirement for procedural and surgical skills training at medical schools by the respective General Medical Councils.¹ Clinical rotations in operative theatre are arranged for all medical students starting their 3rd year in medical school and are considered an essential part of learning and medical training. 1/3rd of the allotted clinical time for all sides (including ward clinics and emergency) is attributed to surgical operation theatre. The aim of the or rotation is that students will be able to learn operative procedure and theatre protocols. Students are given a chance to observe and learn the techniques practiced in OT to maintain aseptic environment and methods of sterilization. Still there is increasing evidence from European countries that medical schools provide insufficient basic surgical skills (e.g., suturing) and learning opportunities for under-graduates are minimal.¹ To attain those surgical skills and to get exposure students feel compelled to attend surgical courses led by surgical societies and professional bodies. Surgical residents mostly cite their under-graduate experiences of surgery as important in influencing surgery as career choice. Thus, a low and inadequate level of under-graduate exposure to surgical practice can have an adverse effect on recruitment of future trainees.⁴ Peer-assisted learning is an established teaching method where students in advance years of a learning teach those in the foundation years.² This technique is increasingly used in medical schools to equip students with basic surgical skills. It's already an effective method for teaching medical under-graduates topics like as gross and neuro-anatomy.³ In the case of learning an interventional technique or multi step procedures that require patients cooperation for complex functional movements problems arise in clinical teaching that demands to reconsider the training approach. The problems in existing observational method of operative table side learning are the lack of observing possible errors and how to overcome those errors. The demonstration given by an experi-

enced surgeon enhances only the accurate steps and is similar to bookish knowledge.

Objectives:

1. To study how effective are the operation theatre clinical rotations among undergraduate medical students in learning different operative procedure in Lahore.
2. to compare the operative learning between different surgical specialties.

Methodology:

Study Design: Cross sectional

Study Area: Private and public medical colleges of Lahore

Study Population: Out going final year and house officers of Private and public medical colleges of Lahore

Sampling Technique: Convenient Randomized sampling

Study duration: Two months

Sample Size: The approximate sample size required to estimate prevalence in large population with the desired level of confidence 95% and desired absolute precision 0.05%. Calculated sample size is 100.

Study subjects selection criteria:

Inclusion Criteria: Medical students from out going final year and house officers

Exclusion Criteria: Medical students from 1st to 4th year.

Study variables assessed: hours dedicated per day to OR classes, attendance in following classes, ways of teaching operative procedure being performed on that day, surgeon's interest in taking OT class, availability of space around operating table to observe procedure being performed, procedures learnt and help in paper solving instruments

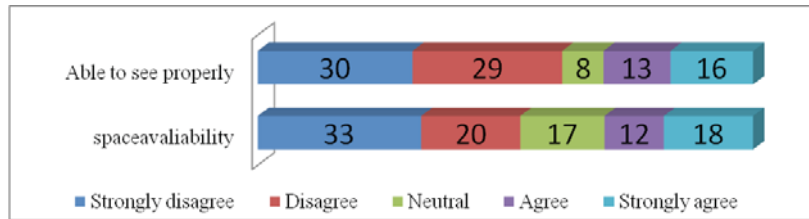


Figure-1: Participants' opinion about OT Environment.

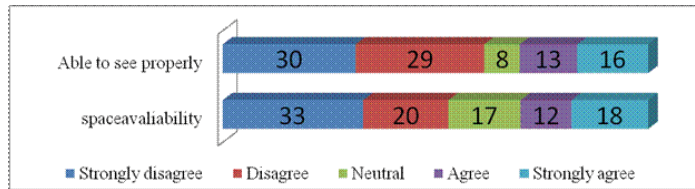


Figure-2: Students allotted per table

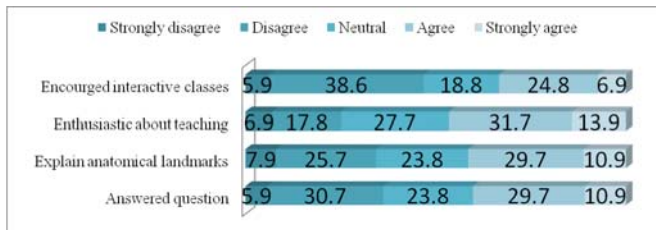


Figure-3: Surgeon's response during procedure

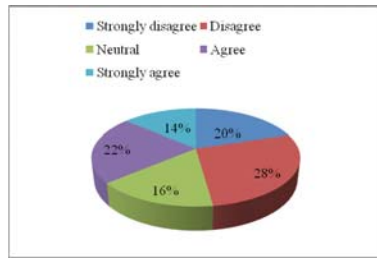


Figure-4: Briefing conducted before procedure

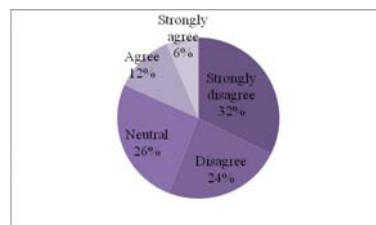


Figure-5: Do O.T. classes help paper solving?

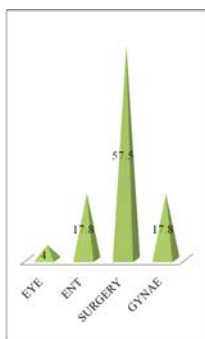


Figure-6: Most effective theatre in learning

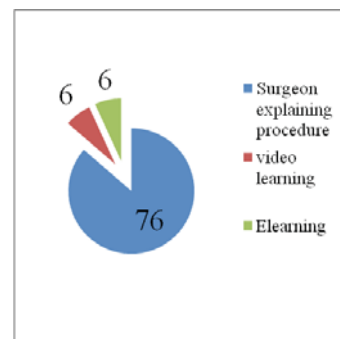


Figure-7: Why effective learning

Questionnaires given to the medical students contains various parameters. Data Compilation and analysis on SPSS version 20

Social and Ethical consideration, observe cultural ethics. Consents will be taken from individual before interview. The information about the name, address, social habits etc. was not be disclosed to any one and was not be used for unethical purposes.

Results:

The outcome of our study has some astonishing results.

51% of the population were females and 49% were males. 78% of them were house officers and 22% were final year students. 34% of population has allotted 2 hour for theatre rotation, 24% has 1 allotted hour and 20% has 3 or 4 allotted hours each. 60% has operation room rotation twice a week. 20% has thrice a week and 15% has rotation once a week. 54% attends the OR rotation frequently. 40% strongly agree that there is no availability of space on OR table while 76% has 4 or more people allotted per table. 52% believe that when procedures are performed by senior before allotted or time it effects the learning procedure. 46% agree that he operating surgeon took a class on what he was going to perform. 60% were confident in their role as a teacher and 46% of them were enthusiastic about teaching. 40% explains the anatomical landmarks and answers the queries per operatively 60% were not being able to visualize the procedure properly 60% were not able to under-standing and memorizing surgical procedure after rotation. Only 18% agree that the rotation help in paper solving while 68% agreed that text books provide a better medium for under-standing procedure. 57.5% has the most effective learning in general surgery OR. 18% considered gynae and E.N.T OR as most effective learning place. Reason for effective learning in 76% of cases is surgeon explaining the surgical procedure with 12% cases of effective learning through video training and e-learning each.

Discussion:

For training purposes med students are allotted specific hours for operation room rotations. our study shows that 34% of population has allotted 2 hour for theatre rotation, 24% has 1 allotted hour and 20% has 3 or 4 allotted hours each. 60% has OR rotation twice a week. 20% has thrice a week. All around the world there is a stipulated requirement for procedural and surgical skills training at medical schools by the respective Medical Councils.¹ Physicians have

long been mastered through the apprenticeship model summarized by the adage "See one, do one, teach one." Medical students are trained by observing a procedure, performing one under the supervision of a resident or attending physician, and then, in turn, practicing and teaching residents and medical students. Since learners retain more information by participating rather than sitting through a passive lecture format, hands-on surgical training has long worked well for building the medical and surgical competence.⁵

However, even with this scheduled and extensive rotation most students were not able to take full advantage of the clinical experience. 40% strongly agree that there is no availability of space on OR table. While 76% has 4 or more people allotted per table. (figure 1 & 2). There is minimal hand on practice and even 60% were not being able to visualize the procedure properly. Recent changes to medical training has made patient-based training more difficult and alone it is not up to the mark to address medical students' needs.⁶ Most notably, patient safety initiatives have led to decreased rotation duration that have decreased patient contact time significantly.⁷ Moreover, increased number of learners with competing training needs often crowd the operative clinical field.

Surgical faculty plays important role in administering surgical skills to medical students. Faculty-led basic surgical skills courses and workshops for under-graduates can increase skills dexterity and interest in surgery as a career^{8,9} but our data shows that only 46% sample population agree that the operating surgeon took a class on what he is going to perform. 60% surgeons were confident in their role as a teacher and 46% of them were enthusiastic about teaching. 40% explains the anatomical landmarks and answers the queries pre-operatively (figure no 3) that's one of the few reasons why students were not being able to take full advantage of surgical OR rotations as 60% of students were not able to understand and memorize surgical procedure after rotation. Only 18% agree that the rotation help in paper solving while 68% agreed that text

books provide a better medium for understanding procedure. (figure no.5) A large percentage of students and house officers were not able to properly learn and practice surgical skills and procedures.

On comparing surgical theatre of different department 57.5% agrees that they had the most effective learning in general surgery OR. 18% considered gynae and E.N.T OR as most effective learning place. (figure no.6) Reason for effective learning in 67% of cases is surgeon explaining the surgical procedure through models or multimedia, with 12% cases of effective learning through video training and e-learning. (figure no.7) A study by Jaiswal Rashmi et al., in Bhopal showed that 54.26% students believed multimedia teaching methods as a best methodology and it relies on logistics scientific data and does not cause lack of attention.¹⁰ As for the teaching maximum no of students believes that dissection hall teaching is the best method followed by slide projector/conventional chalk and board methods as opined by Gholamreza Hassanzadeh, Narges Hassanpoor.¹¹

Use of simulations can help medical students in Pakistan to learn better regarding operative surgical technique, theatre discipline. A simulation is a controlled created setting where some aspects of a real surgical task are recreated for the training purposes. Cadaveric human or animal tissue, physical models, living animals and computer programs are all examples of simulations. Although plastic training models are far from reality, they have several advantages, such as low cost, portability, possibility of unsupervised use and recyclability, which enables unlimited amount of practice.¹² The use of bio-models provides opportunity to learn, practice and refine preparative jobs, operative techniques and movements.¹³⁻¹⁸ Simulation is purported to have some distinct advantages for medical training, such as hand on practice and the presentation of scenarios that are operated upon in a setting where there is 'permission to fail', therefore allowing students to learn from mistakes without causing any harm to patient.¹⁹⁻²¹ Virtual reality surgical simulation is the production of

computer-generated surroundings that imitates surgical training environment. Depending upon the learning surgical skill, simulations may produce (3D) graphics, sounds and a sense of touch within the virtual environment.²² Virtual reality is well suited for the implementation of simulation in surgical training.²³

Conclusions:

We conclude theatre rotations are not very helpful in learning procedure due to non availability of space around the operating table, more number of students per table and no pre procedure briefing. Theatre with video training and e learning has more effective learning. learning surgical skill, simulations may produce (3D) graphics, sounds and a sense of touch within the virtual environment.²² Virtual reality is well suited for the implementation of simulation in surgical training

Conflict of interest: None

Funding source: None

Role and contribution of authors:

Dr Syeda Ayesha Hashmi, did literature review, research design and finalized the manuscript.

Dr Nazish Zia, helped with the study design

Dr Samia Asma, helped in final draft

Dr Syeda Fatima Hashmi, helped in collection and analysis of data

Dr Yasir Tarar, helped in collection and analysis of data

References:

1. Davis CR, Toll EC, Bates AS, Cole MD, Smith FC. Surgical and procedural skills training at medical school: a national review. *Int J Surg* 2014; 12: 87782.
2. Lockspeiser TM, O'Sullivan P, Teherani A, Muller J. Understanding the experience of being taught by peers: the value of social and cognitive congruence. *Adv Health Sci Educ Theory Pract* 2008; 13(3): 36172.
3. Hall S, Lewis M, Border S, Powell M. Near-peer teaching in clinical neuroanatomy. *Clin Teach* 2013; Aug; 10(4): 2305.
4. Glynn RW, Kerin MJ. Factors influencing medical students and junior doctors in choosing a career in surgery. *Surgeon* 2010; 8: 18791.
5. Gardner R, Raemer DB. Simulation in obstetrics and gynecology. *Obstet Gynecol Clin North Am.* 2008;35:97–127.

6. Okuda Y, Bryson EO, DeMaria S, Jacobson L, Quinones J, Shen B, et al. The utility of simulation in medical education: What is the evidence? *Mt Sinai J Med.* 2009;76:330–43.
7. Accreditation Council for Graduate Medical Education Bulletin. Simulation and Rehearsal, Dec 2005. Accessed at www.acgme.org on 8/14/13.
8. Li R, Buxey K, Ashrafi A, Drummond KJ. Assessment of the role of a student-led surgical interest group in surgical education. *J Surg Educ* 2013; 70: 558.
9. Patel MS, Mowlds DS, Khalsa B, Foe-Parker JE, Rama A, Jafari F, et al. Early intervention to promote medical student interest in surgery and the surgical subspecialties. *J Surg Educ* 2013; 70(1):.
10. Jaiswal R, Sathe S, Gajbhiye V, Sathe R. Students perception on methods [8] of anatomy teaching and assessment. *Int J Anat Res.* 2015;3(2):1103-08. Hassanzadeh G, Hassanpoor N, Jalali A, Hassanzadeh N, Jafari M,
11. Panahi N. Teaching anatomy: viewpoints of Iranian anatomists. *Thrita J Med Sci.* 2012;1(2).
12. Denadai R, Saad-Hossne R, Oshiiwa M, Bastos EM. Training on synthetic ethylene vinyl acetate bench model allows novice medical students to acquire suture skills. *Acta Cir Bras.* 2012 Mar;27(3):271-8. PMID: 22460260. Lentz GM, Mandel LS, Goff BA. A six-year study of surgical teaching and skills evaluation for obstetric/gynecologic residents in porcine and inanimate surgical models. *Am J Obstet Gynecol.* 2005 Dec;193(6):2056-61. PMID: 16325615.
13. Beard JD, Jolly BC, Newble DI, Thomas WEG, Donnelly J, Southgate LJ. Assessing the technical skills of surgical trainees. *Br J Surg.* 2005 Jun;92:778-82. PMID: 15810048.
14. Brydges R, Kurahashi A, Brümmer V, Satterthwaite L, Clasen R, Dubrowski A. Developing criteria for proficiency-based training of surgical technical skills using simulation: changes in performances as a function of training year. *J Am Coll Surg.* 2008 Feb;206(2):205-11. PMID: 18222371. 12. House AK, House J. Improving basic surgical skills for final year medical students: the value of a rural weekend. *Aust N Z J Surg.* 2000 May;70(5):344-7. PMID: 10830596.
15. Moulton CA, Dubrowski A, Macrae H, Graham B, Grober E, Reznick RK. Teaching surgical skills: what kind of practice makes perfect? A randomized, controlled trial. *Ann Surg.* 2006 Sep;244(3):400-9. PMID: 16926566.
16. Qayumi AK, Cheifetz RE, Forward AD, Baird RM, Litherland HK, Koetting SE. Teaching and evaluation of basic surgical techniques: the University of British Columbia experience. *J Invest Surg.* 1999 Nov-Dec;12(6):341-50. PMID: 10630398.
17. Xeroulis GJ, Park J, Moulton CA, Reznick RK, Leblanc V, Dubrowski A. Teaching suturing and knot-tying skills to medical students: a randomized controlled study comparing computer-based video instruction and (concurrent and summary) expert feedback. *Surgery.* 2007 Apr;141(4):442-9. PMID: 17383520.
18. George 2010 George AP, De R. Review of temporal bone dissection teaching: how it was, is and will be. *Journal of Laryngology and Otology* 2010;124(2):119–25. [PUBMED: 19954559]
19. Satava 2008 Satava RM. Historical review of surgical simulation - a personal perspective. *World Journal of Surgery* 2008;32: 141–8.
20. Rourke 2010 Rourke L, Schmidt M, Garga N. Theory-based research of high fidelity simulation use in nursing education: a review of the literature. *International Journal of Nursing Education Scholarship* 2010;7(1):Article 11. [PUBMED: 20361859]
21. Rafiq 2008 Rafiq A, Francisco T, Boanca C, Lavrentyev V, Merrell R. Objective assessment of training surgical skills using simulated tissue interface with real-time feedback. *Journal of Surgical Education* 2008;65(4):270–4.
22. Zirkle 2007a Zirkle M, Taplin MA, Anthony R, Dubrowski A. Objective assessment of temporal bone drilling skills. *Annals of Otolaryngology and Rhinology and Laryngology* 2007;116(11):793–8. [PUBMED: 18074662]