Original article

Simulated based teaching module of postpartum hemorrhage for final year students.

Meeta Gupta, Poonam Yadav.

Abstract:

Aim and Objectives

1.To plan a simulated module for PPH management for final year students.

2.To sensitize the fellow faculty for simulated teaching

3.To assess the feedback of students and faculty to simulated teaching module

Methodology:

After getting the ethical clearance from the institute, a total of 100 final Year Medical Students were subjected to a conventional teaching module of PPH management (chalk and board) for 30 minutes followed by a multichoice questioner (comprising of 10 questions). They were allocated 2 minutes for each question (total—20 min) .

The students were then divided into four groups randomly. Each group had 25 students. Each group had senior faculty as their facilitators. An OSCE station was prepared and the faculty was asked to assess the students according to the checklist provided to them(pre-test).

Next day a demonstration of the practical clinical skills for the management of PPH on a dummy patient was done by the faculty. The students observed the PPH management skills for the next 30 minutes. The entire management protocol was demonstrated 3 to 5 times by the faculty in front of the entire class.

Each student had to undergo DOAP i.e. demonstrate observe, assist and then lastly perform all the steps of PPH management on an electronic dummy pelvis(Mama Natalia). A post-test was then taken. The score of both the pre and post test was analyzed.

Findings:

These scores showed dramatic increase on the clinical skills involved in the management of PPH (post-test) after a simulated class .

Conclusion

This study substantiates the use of simulated teaching/role play as one of the unique method for teaching in Medical education. 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.

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BACKGROUND

India is the seventh largest country by area, and with more than 1.3 billion people, it is the second most populous country as well as the most populous democracy in the world. Maternal mortality rate (MMR) is defined as the number of maternal deaths per 100,000 live births. The MMR, according to the sample registration system (SRS) data released by the office of Registrar General of India, declined from

Authors Affiliations

Meeta Gupta
Associate Professor,

Department of Obstetrics and Gynaecology,ASCOMS Jammu

PoonamYadav
Associate Professor

Deptt of Obst&Gynae
S.N. Medical College,
Agra, (U.P)

Correspondence
Dr.Meena Gupta
Associate Professor Department of Obst,&Gynae,
ASCOMS ,Jammu.
Mobile: +9419316294-
Email-meeta448@gmail.com

Indexed

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Key Words: Postpartum hemorrhage, simulated teaching

212 in 2007 to 130 in 2014-16 from 167 in 2011-13[1]. The 22% reduction in MMR since 2013 means nearly one thousand fewer women now die of pregnancy -related complications each month in India[2].Despite a decrease in the MMR due to increased number of hospital deliveries, the maternal mortality has not decreased to an extend as expected, in spite of the mammoth work done by various government and non-government organisations.

Why is the idea necessary?

According to UNICEF, globally about 800 women die every day of preventable causes related to pregnancy and childbirth: 20 percent of these women are from India. Annually, it is estimated that 44,000 women die due to preventable pregnancy related causes in India[3]. This proves that in developing countries like India, maternal mortality is still a huge public health issue. Causes range from excessive blood loss (post-partum hemorrhage) to infections, primarily because women do not give birth in a hospital or a health center.The steps taken in the initiation of the management of PPH during the first hour (Golden Hour) is the most decisive step in controlling the mortality and morbidity of pregnant females in relation to PPH. Our students have sufficient theoretically knowledge to correctly manage the patients presenting with PPH, but what they lack is to apply that theory into practice.

Transfer of knowledge from teachers to students traditionally occurs in one direction using black boards which offer opportunistic, unstructured environment of the emergency department[4]. The mantra "see one, do one, teach one" is often repeated to residents throughout their training[5]. The clinical skills of our students 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.

AIM & OBJECTIVES

Aim:

1.To plan and implement a simulated module for PPH management for final year students(total-100)
2.To sensitize the fellow faculty for simulated teaching.
3.To assess the feedback of students and faculty to simulated teaching module

Specific Objectives:

The main objective for developing this module is that the final year medical students should be able to diagnose , manage and timely refer if required a patient presenting withpostpartum haemorrhage.

METHODOLOGY

Faculty sensitization

After taking the ethical clearance from the Institute, the entire faculty of the department was sensitized to simulated teaching technique. A ten questions MCQ was prepared by the faculty.

Conventional teaching with MCQ Test

The final year students(total 100)initially had a conventional teaching of PPH management (chalk and board) for 30 minutes followed by a multiple choice questioner (comprising of 10 questions). The students were allocated 2 minutes for each question (total—20 min) .

Pre-test

The students were then divided into four groups randomly(roll call 1-4),each group comprisingof 25 students.Each group also had an Associate Professor and an Assistant Professor as their facilitator. An OSCE station was prepared and the faculty was asked to assess the students according to the checklist provided to them(pre-test).

Role play and Post test

The entire class returned back the next day in the department of obstetrics and gynaecology. A role play was enacted in front of the students by the faculty depicting an emergency where a profusely bleeding patient was brought in the casualty by the attendants (dummy patient). The students observed the PPH management skills on the dummy-patient done by the faculty in the next 30 minutes. The entire management protocol was demonstrated 3 to 5 times by the faculty in front of the entire class.

The students again assembled back in their respective groups (according to the previous day) with their concerned faculty. Each student had to undergo DOAP i.e. demonstrate observe, assist and then lastly perform all the steps of PPH management on a motorized dummy pelvis (Mama Natalia). Finally, a post test was again taken after the completion of this entire exercise.

Feedback: Post session, feedback was taken from the students and faculty on a questionnaire, according to the Likert scale: 1-5

1-Poor, 2-Average, 3-Good, 4-Very Good and 5-Excellent.

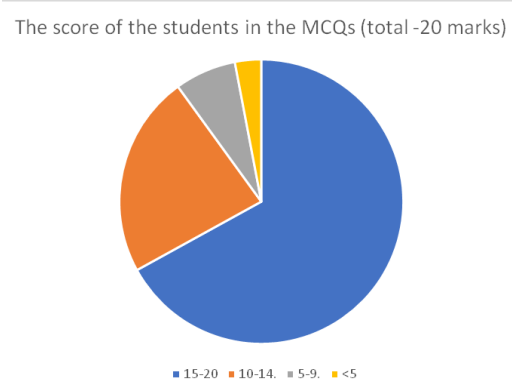
All the data was finally analyzed and the results were finally compiled

OBSERVATIONS AND RESULTS

The study was conducted in the Department of obstetrics and gynecology and all the final year

students were enrolled in the study after informed consent.

Fig-1: TOTAL Students—100



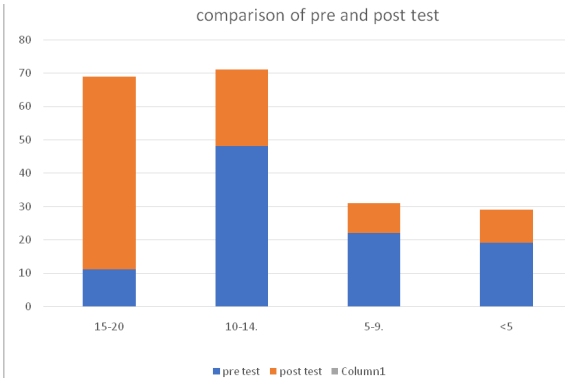
The students on an average scored fairly above average in the theoretical aspect of the PPH management

As proven by the pie-chart (Fig-1)but when the minor details were checked for in practical demonstration, the very same students scored poorly. The students were very good in their theory part, but the application of practical aspects was grossly lacking in them. This was proved according to the Pretest score as shown in Fig 2.

The same students scored very well when they were taught the practical clinical skills application on simulation models, as they were applying their theoretical and clinical skills in conjunction. This was proven by their scores in the Post-test evaluation(Fig-2)

The impact of intervention was evaluated . For the given data, the chi-square value is 49.1 and "p" value is <0.001, thereby depicting that there was a significant change in post-intervention scores as compared to pre-intervention scores, hence the intervention was successful.

Fig-2



The Faculty and the student feedback was very encouraging as shown in Fig 3 and 4 respectively, as most of the students and faculty had accepted this newer modality of teaching despite the initial difficulties faced by us.

fig-3

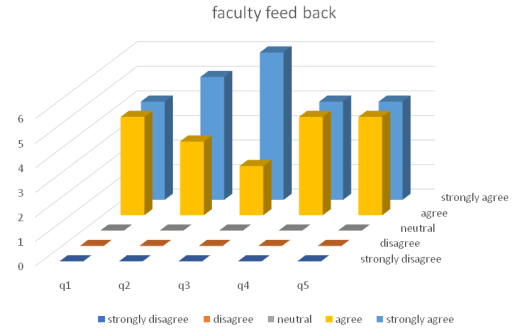
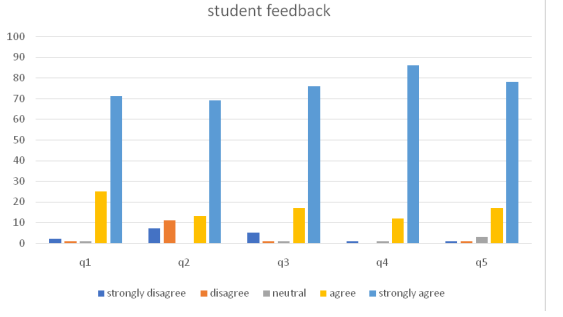


fig-4



DISCUSSION

Method of teaching is supremely important in teaching any branch of knowledge. This is clearly depicted by Fig 1 of our study, where majority of our students(67%) scored very good marks and another 23% students scored above average marks This involved in the assessment of the students in the theoretical aspects of the PPH management protocol.

According to Hashweh (1987), "Simulated teaching consisted of a critical-incident technique. The effects of subject-matter knowledge were apparent here through the teachers' use of evaluative structures and responses to critical incidents".For example, flight simulators are used by aeronautical engineers and trainee pilots to comprehend how an aircraft would respond in a numerous situations without ever quitting the ground.Medical simulation mimics clinical care, allowing individual health professionals and teams to develop and maintain skills necessary for safe and effective clinical care. It enables trainee surgeon practice remotely from patients thereby gaining confidence and becoming more efficient [6]

In medical colleges in India, the students are usually

taught by means of didactic lectures, tutorials and practical classes. Such a system is teacher centred with minimal active participation from the students[7,8]. 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. Likewise, in our study our students also lacked in the application of their theory knowledge to practical use as proved by the Pre-test score.(Fig 2)

According to Ruben (1999), "Simulations, games, and other experience-based instructional methods have had a substantial impact on teaching concepts and applications". Simulation refers to the replica of real world proceedings and exercise in a secured milieu. Simulations aim to dispense an occurrence as close to the genuine thing as possible; however, a simulated proceeding has the supremacy of allowing the learners to 'reset' the milieu and try other approaches and tactics. This permits learners to develop experience of a particular situation by exercising their extensive learning and proficiency. When simulation was added as a teaching method in our study, the students performance was brilliant in all the clinical aspects involving the PPH management protocol which was one of the main aims for undertaking this study. This observation was supported by the data as depicted in Fig 2 where the pre-test and post-test scores of the students were evaluated.

Whether the examination is gynecological or obstetrical, patients need to take off their pants and expose their perineum because of the particularities of obstetrics and gynecology treatments. Patients often 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.

Mayer describes in the 'cognitive theory of multimedia learning' that people receive and process new information via two separate but independent pathways: verbal and visual. These are additive such that both images and words provided together as in virtual simulation are better learned than information provided through either pathway alone. Virtual simulations training and serious gaming provide both input and are often exceptional ways of learning[9].

The Experiential Learning Theory (ELT) developed by David Kolb (1982) 'comes alive' and explains well how simulation translates to deep learning. It provides a mechanism for how experience is transformed into knowledge, skills and attitudes.

MECHANISMS OF SIMULATION

Simulation /gaming operate on certain principles which are given below:

1. Players take on roles which are representatives of the real world and then make decisions in response to their assessment of the setting in which they find themselves.
2. The experiences simulated the consequences which relate to their decisions and their general performance.
3. The 'monitor' the result of their actions are brought to reflect upon the relationship between their own decisions and the resultant consequence.

In medical education, medical simulation models and simulation teaching have a broad range of applications. 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[10,11]. Compared with other medical teaching methods, simulation is noninvasive, convenient, repeatable, and inexpensive. It is likely to become a commonly used teaching method[12]; therefore, forresidents and medical students at various stages, practice with medical simulation models and evaluations of training on those models are very important.

When we analyzed the feedback as received from our faculty (Fig 3) 100% of our faculty agreed with the positive change in the learning habits of our students, as well as the knowledge application

by our students in these simulated surroundings.

The feedback received by our students was most astonishing where more than three-fourth of our students were happy with the faculty interaction and answer to the queries. More than 75% of the students agreed that this method was different and better than traditional teaching and this also helped them to rectify their mistakes as shown by Fig 4.

Outcomes: What this study adds

The simulation model 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.

Limitations:

1) faculty sensitization as most of the teachers lack the technical knowledge required for the implementation
2) too much mobilization of supporting staff (human resources)
3) lot of planning was required and coordination between all the faculty members as well as with the supporting staff
4) All the students are not interested and willing to participate and get engaged.
5) It is a time consuming technique.

My Reflections:

- ***What was good:***
  The post-test assessment was so encouraging and the final year students were able to demonstrate all the steps of PPH module so perfectly, and this change in our students made our work very rewarding.
- ***What could have been differently:***
  There was lot of chaos on the first day and it was difficult to manage the students.
  The coordination was lacking on the first day and after a lot of confusion we were able to complete the module. It involved extra effort from the junior faculty and to convince them for the new task was very exhausting.

The road ahead:

The students score improved drastically in the post-test score as compared for the pre-test as well they were able to demonstrate all the clinicals skills in management of PPH. With passage of time , I hope that the faculty will be able to improve our teaching skills on simulated models, and probably in one or two years we will be able to incorporate this PPH simulation module in our curriculum.

CONCLUSIONS

"I Hear and I Forget, I See and I Remember, I Do and I Understand"

-Famous Chinese Proverb

This study substantiates the use of simulated teaching/role play as one of the unique method for teaching in Medical education. 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. The simulation model course deepened the students' impressions and helped educators better address the objectives of gynecology and obstetrics teaching.

IMPLICATIONS

This will prove to be an effective strategy in further bringing down the MMR, by proper management during labor and delivery, which is the most critical period in the management of PPH

This will help us to achieve the country's MMR target of 70 by 2030, under the sustainable development goals earlier ,thus improving the public health at large.

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