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High Fidelity Virtual Simulation: A Rising Way of Learning Intrapartum Emergencies Management in Obstetrics to Reduce Human Errors.

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Abstract

In the upcoming era of india where medical science is upgrading to reduce the errors in patient's management in order to give the maximum life expectancy. Virtual reality is a best tool for the students to learn even before to see the actual patient. In gynaecology & obstetrics simulation is of great importance. As it is not always possible to show or teach all the conditions in patients somewhere due to lack of particular cases or privacy issues.

Simulation is a technique for practice and learning that can be applied to many different disciplines and trainees. It is a technique (not a technology) to replace and amplify real experiences with guided ones, often "immersive" in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. [1] Fidelity in simulation has traditionally been defined as 'the degree to which the simulator replicates reality [2]

Today's obstetrician needs a mix of manual and communication skills, as well as quick emergency response and decision-making abilities. As a result, simulation can aid in the development of these abilities. This may not only meet patients' high standards and demands of doctors and midwives, but it may also aid in maintaining composure in stressful conditions and avoiding mistakes.[3]

In obstetrics, simulation appears to be a widely recognised tool for team preparation in emergency situations. More research is needed to see if patient protection improves after using drill training on a daily basis.[3]

Keywords: - simulation, virtual reality, fidelity, gynaecology & obstetrics 8%

Introduction

In medical education the practical learning always holds a prime importance as without this it is impossible to acquire complete knowledge. Virtual reality simulation is the new concept in medical field to give maximum practice to gain the accuracy and to reduce errors which are likely to happen by

learning doctors. Simulation is a technique to replace and amplify real experiences with guided ones. Fidelity in simulation has traditionally been defined as 'the degree to which the simulator replicates reality[2], high fidelity simulation modules gives the real time experience of the cases. Simulators were first developed in the 1920s for pilot training, and their ability to replicate clinical condi tions has since been applied to obstetric and gynecologic education. In the 1960s, uniform patients and mannequins were used in medical school simulations. With the introduction of simulation tools for medi cal education in the 1980s, simulation has continued to grow. [4]

As far as the obstetric is the concern high fidelity simulation is the great media for the students to learn the virtually real experience of handling the emergency cases. Because in emergency cases bed side learning can't give the full access to new learner as it is always the priority to handle the case with maximum efforts, in that case educationg the new one is a secondary task for a doctor. In this covid situation where the patient's exposure to students is minimized use of simulation is the best way to continue teaching & learning procedure.

it is beneficial to practice model procedures and simulated scenarios. Regular delivery, postpartum hae morrhage, instrument deliveries, shoulder dystocia, infant malpresentation, massive blood transfusion p rocedure, disseminated intravascular coagulation, or amniotic fluid emboli are all can be covered in clinical simulation experiences.Training in the management of intrapartum emergencies on a daily basis has been shown to have measurable effects on maternal and perinatal outcomes.Manual skill s in the labour room have gradually been assisted by the use of ultrasound in recent years, and this has g reatly improved the realistic management of intrapartum emergencies in real life.The most appropriate method for modern highfidelity simulation in the management of intrapartum complications appears to be a new generation of mannequins suitable for both clinical manoeuvres and ultrasound analysis. [4]

Objectives of high fidelity simulation

Human error or deviation from standard procedure are the most common causes of adverse events. [6]

The use of simulation training can help to reduce errors. Prior to clinical practise, simulation training pro vides residents and students with skills and experience and repetition. High-fidelity simulation, used as a clinic tool, facilitates student preparedness for possible future clinical situations, meets desired student outcomes and clinical competencies, and allows for error, repetition, practice, and questions without risk of harm to actual patients . [15]

Simulationbased skill testing is a viable way for residents and students to learn. Learning with patients w ould be a lot easier if this was developed and standardised. [7]

Method of conduction

Briefing is an informative part of simulation conduction. prebriefing & debriefing are the two techeniques of briefing. Prebriefing is an orientation program designed which is to be held prior to the conduction of simulation in which information about simulation model, its function, its environment & objectives of simulation is given.

The importance of a presimulation briefing is critical to a good simulation experience. It trains and orient s learners prior to the start of the simulation, ensuring that the simulation experience is consistent and b eneficial to the participants.[9] after the conduction of scenario debriefing is to be conducted. The debriefing session included the observations of a properly performed scenario. [8] Debriefing is the intentional discussion following the simulation experience that allows participants to gain a clear understanding of their actions and thoughts process to promote learning outcomes and enhance future clinical performance.[10]

Scenario designing

Obstetric emergency drills are scenario-based trainings conducted in 'real time' in the normal working environment. These drills aim to test both the local emergency response system and protocols that facilities have in place to manage obstetric emergencies. Drills can also be used to test professional teamwork dynamics and individual providers' skill and knowledge.[19] The World Health Organization has recognized the development of locally effective and inexpensive solutions for training caregivers as a priority. [20] The drill involves health providers from the facility who simulate the emergency management of the obstetric complication as a team including 1)an obstetrician, 2)a midwife, and a 3)nurse. Participating personnel are not notified of the obstetric emergency drill in advance and have to react as if it were a real emergency. Obstetric emergency drills should be conducted at a frequency that is appropriate for maintaining skills of clinical staff. [19] As well as it is backed by evidence, that can be used for the improvement in the rate of positive perinatal results [11] the selected multidisciplinary team which is involved in the care and attention of the patients during obstetric emergencies, it is necessary to train these professional workers as a group to guarantee excellence in their work [12].

in obstetric emergencies for health professionals, the specific objectives are as follows:

1. Determine the health-care provider's educational standards for obstetric emergencies.
2. Create and validate a basic module for assessing obstetric simulation training competencies.
3. Collaborate with a multiprofessional team to create and run training scenarios in obstetric emer gencies.
4. Compare the actions of health practitioners when dealing with different obstetrical situations.
5. describing the experience, satisfaction, mistakes & the gained perception after simulation drill.

Assessment of procedure skill

High-fidelity simulation specifically improved students' feeling that they understood both the physiology of parturition and the obstetric procedures. Students in the simulation group also felt better prepared for obstetric house jobs and performed better in obstetric skills evaluations.[14] after scenario conduction assessing the performance errors & acknowledging the reason of the errors. The fix that by proposing the solution in order to improve performance in an emergency situation, identification of the best practices and enhance their use. Drills can also be used to test professional teamwork dynamics and individual providers' skill and knowledge [19]

Decision Making and Leadership Development in obstetrics

Performing emergency management on mannequins rather than on patients is beneficial for the health professionals & students. As it is a planned scenario so the learner can take the apportunity to make mistake, practice repeatedly up to the excellency that repeatative practices makes learner more confident through the process. Repeated practice develops the decision making quality, as it is a hands on practice to see the actual status of case & that way the sense will get develop for the needed steps to be taken.

Continuing Education

There is a need of repeated practice to reduce the Simulation-based obstetric emergency team training can reduce adverse maternal as well as fetal outcomes. [16] as in india still the maternal morbidity & moratality rates has not dropped that much, the simulation based practice can definitely add some value in improving the status.

Clinical Significance

Evidence exists for a positive impact of training in obstetric emergencies, although the majority of the available evidence applies to evaluation at the level of participants' confidence, knowledge or skills rather than at the level of impact on clinical outcomes. [17]

Conclusion

An Indian hospital study found the MMR 50-98% of maternal deaths are caused by direct obstetric causes (hemorrhage, infection, and hypertensive disorders, ruptured uterus, hepatitis, and anemia). [21] This is why the excellency & accuracy is needed in the management of emergencies in obstetrics. And to reduce the errors in management of emergency obstetric conditions. Simulation is a means of training to improve the management of obstetric emergencies. [19] specially high fidelity & hybrid simulation modules are the best tools to conduct the training for students & health professionals. Health Professionals can gain the knowledge, practice, improve from mistakes, protocol formation. Through all these one can gain enough confidence to handle emergency in actual patient.

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