IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Review Article: Simulation In Nursing And Its Types

[1]Diksha Biswal, [2]Sakshi, [3]Shilpa S

[1] PG Tutor, [2] PG Tutor, [3] PG Tutor

[1]Department of Adult Health Nursing

[1]Lakshmi Bai Batra College of Nursing, , Batra Hospital & Medical Research Centre (BHMRC),

Tughlakabad Institutional Area, M.B Road, New Delhi 110062, India

Abstract: Over the past few decades, simulation has become more widely used in the medical field. It has developed into an active and perceptive pedagogy via the evolution of its various forms. In many training programs, including those in nursing, obstetrics, emergency medicine, anesthesia, neonatal care, and mental health, it is a common teaching method. It is an effective level for raising patient safety and care quality. Teachers can bridge the gap between theory and clinical placements by combining a variety of simulation types and their diverse applications with more conventional teaching techniques. It takes a great deal of expertise to incorporate these cutting-edge resources into instructional strategies. Several research indicate that in order to produce a convincing articulation between knowledge and procedures, this implementation translates into new instructional requirements. Through immersion, reflection, feedback, and practice across the Pre-brief, Simulation scenario, and Debrief phases, simulation supports learning. Prior to performing a simulation session, the facilitator should make sure that all prerequisites have been met. With this approach, students can learn at their own pace, freely make mistakes, and practice their clinical skills frequently until they feel proficient. Clinical procedures are replicated in a secure setting through this instructional process. Nursing students that participate in simulation-based learning programs are able to improve their critical thinking and clinical decision-making abilities while making fewer medical errors in clinical situations.

Index Terms **-** Simulation, Simulation Scenario, Simulation in Nursing

I. INTRODUCTION

The incompatibility between theory and practice is one of the main issues challenging nursing education. The actual application of academic knowledge presents challenges for nursing students, an issue that is prevalent worldwide. The gap between theory and practice makes learning more difficult, and a student's ability to integrate professionally is impacted when they don't understand nursing terms and concepts. This is accomplished by having a thorough understanding of healthcare science, where practical skills and nursing theory coexist together. Simulation is a teaching method that supports this approach.[1]

Nursing simulation began in 1911 when students learned how to turn, transport, and dress patients using Mrs. Chase, the first mannequin. Over the past 111 years, simulation techniques have significantly improved, but the fundamental idea has not changed. Students can apply what they have learnt in class in a safe and realistic environment through simulation. They can then apply the knowledge they gained from the simulation to clinical practice.[2]

Nursing students' learning demands are fully satisfied by simulation, which enables the development of both technical and non-technical abilities. Numerous researches have shown how simulation can be used to improve clinical performance, foster introspective attitudes, stimulate critical thinking, and reinforce theoretical knowledge. Likewise, simulation can be used to enhance teamwork and communication abilities. It gives students an appropriate setting in which to apply and implement the knowledge they acquire in class into practice.[3,6]

Imitation or portrayal of one behaviour or system in actual or likely real-life conditions is called simulation. a phase in between classroom education and hands-on clinical training improves and promotes critical thinking and learning. In the context of nursing, simulation is the use of simulated situations and resources to establish a secure and regulated setting in which students may refine their clinical skills and sharpen their critical thinking abilities prior to working with actual patients. From low-fidelity exercises with simple equipment to high-fidelity simulations that use sophisticated manikins and technology to mimic real-life patient care scenarios, these simulations can take many different forms.[4,6]

A student or group of students will use the simulation approach to conduct various patient care tasks on a manikin, player, or standardized patient, depending on the clinical circumstance or scenario. With the help of the simulation approach, students can study at their own pace, freely make mistakes, and continually practice their clinical abilities until they feel proficient. Clinical procedures can be replicated in a secure setting through the instructional process of simulations.[4]

The following are some elements that have highlighted the necessity for nursing students who aspire to become nurses to master competencies:

1. A rise in errors in medicine.
2. Recent advances in technology in the healthcare sector
3. Boosting patient awareness and initiatives that foster patient satisfaction
4. Acquire a high degree of student engagement
5. Increased satisfaction with patients due to nursing students' enhanced clinical performance[5]

These competencies are accomplished through the use of learned material, skill development, incorporating critical thinking and decision-making abilities into case management, and simulation-based learning. By practicing consistently and gaining expertise before joining the actual clinical practice setting, simulation helps nursing students and novice nurses to improve competencies in a simulated setting.[5]

II. Importance of Simulation in Nursing Education

One technique that may be made to mimic real-life situations is simulation, which offers the chance to perform tasks in environments that are more accurate and realistic compared to real ones. A student or group of students will use the simulation approach to conduct various patient care tasks on a manikin, player, or standardized patient, depending on the clinical circumstance or scenario.[4,6]

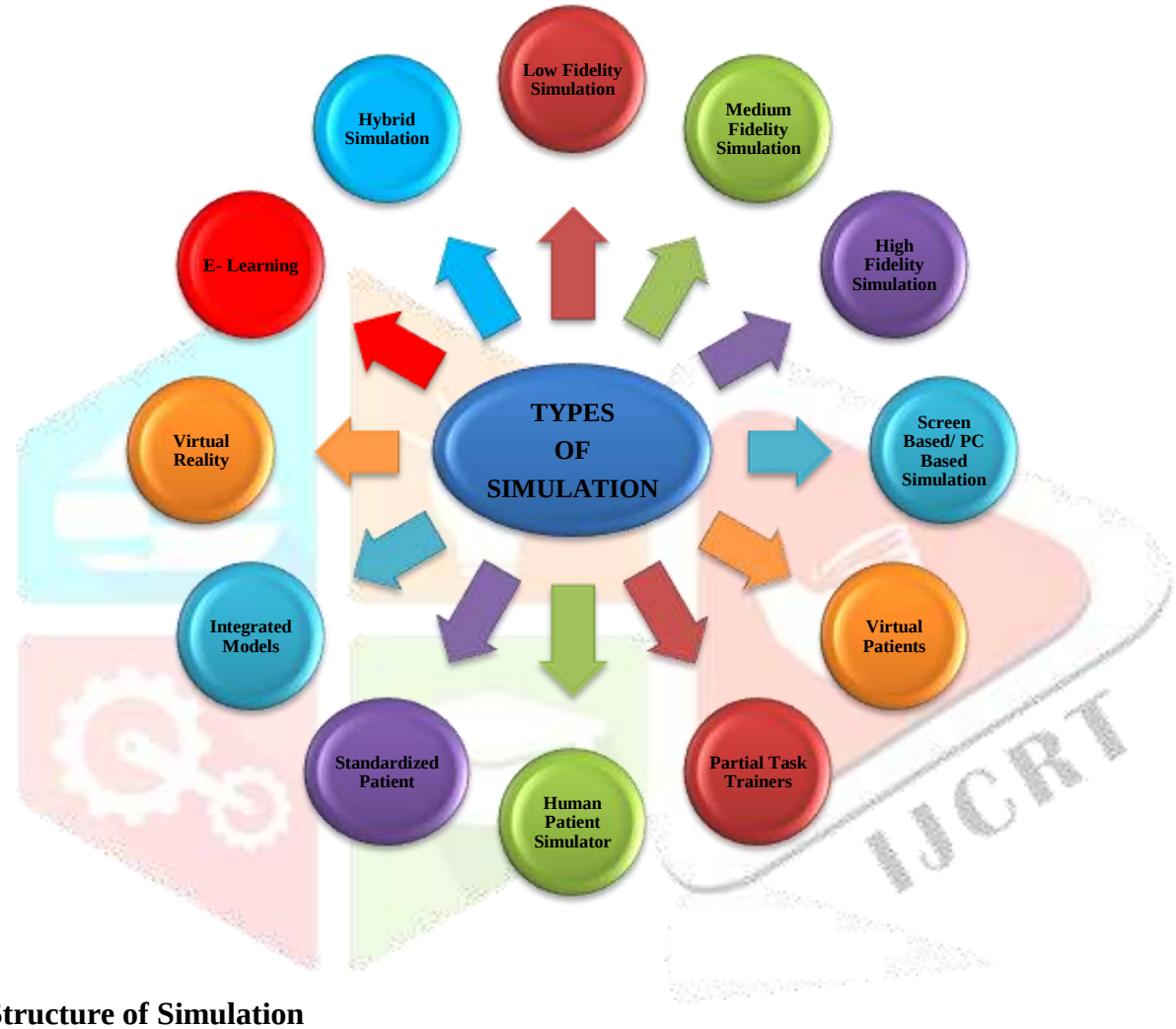
With this approach, students can learn at their own pace, freely make mistakes, and practice their clinical skills often until they feel proficient. Clinical procedures can be replicated in a secure setting through this teaching approach. Nursing students that participate in simulation-based learning programs make fewer medical errors in clinical settings and can improve their critical thinking and decision-making skills.[4,6]

III. Types of Simulation

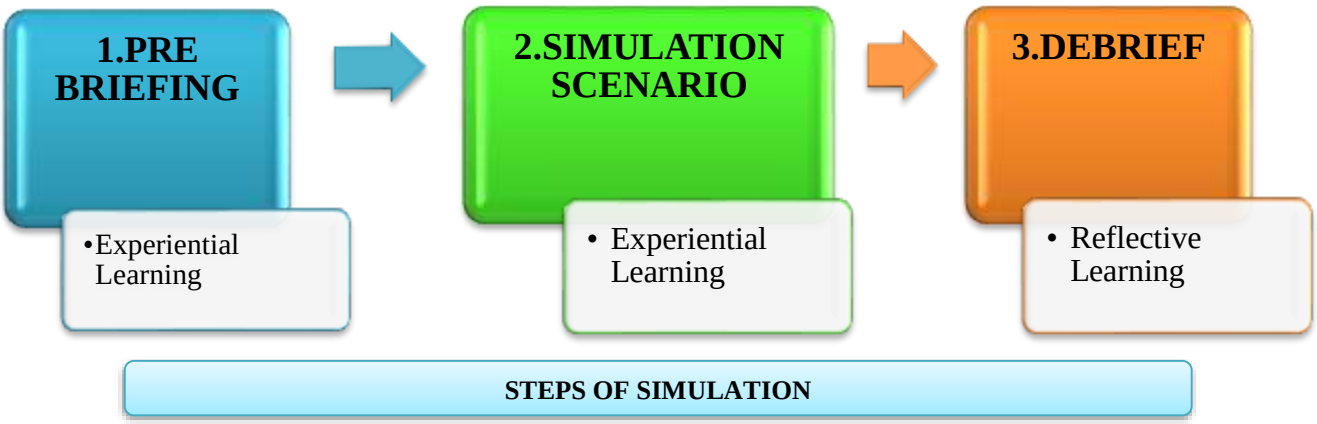
SNo.	TYPES OF SIMULATION	PICTORAL PRESENTATION
1.	**Low Fidelity Simulations:** For developing a certain skill, use part task trainers, which are static, anatomical parts of the body (such as the IV arm). The usage of oranges to teach intramuscular injection in the past may have something to do with it.[5]	
2.	**Medium Fidelity Simulations**: Compared to low fidelity simulation, it feels more realistic because it uses sophisticated full body manikins that can speak, blink, and produce various sounds, such as heart, breath, and bowel sounds. A range of procedures, from basic physical examinations or subcutaneous injections to more complex ones like ET insertion, suctioning, and CPR (e.g., Nursing Anne), can be carried out on these simulators.[2]	
3.	**High Fidelity Simulations**: Uses fully automated, full-body, adult simulators that are computer-assisted, electricity-operated, and can be pre-programmed or customized. These simulators can be used to simulate blood loss, wounds, seizures, chest rise and fall, and full range of motion. They can also be used to simulate tongue edema, laryngospasm, and secretions like sweat, tears, and CSF. They can project instructor-controlled vital parameters, ECG, SpO2 waveforms, ABP, CVP, and other vital signs, and they can depict physical signs like cyanosis, CO2 exhalation, peripheral pulses, and pupillary reaction (e.g.-SimMan 3G plus). These high-fidelity simulators can be used to perform a range of advanced procedures, such as volume infusion, stomach decompression, and chest tube insertion, to give students an immersive educational experience.[5,6]	
4.	**Screen based / PC Based simulation**: Interactive computer programs that replicate real-world situations for training, instruction, or evaluation are also referred to as virtual simulations.	
5.	**Virtual patients:** An interactive computer simulation of a real-world clinical situation is called a "virtual patient" and is mostly utilized for medical education, training, and evaluation. These simulations provide professionals and students with a secure setting in which to hone their abilities, clinical reasoning, and decision-making procedures.	

6.	**Partial Task Trainers:** Specialized training tools or models known as partial task trainers are made to impart a particular skill or process in a safe, regulated setting. They isolate a specific task, enabling skill development and repetitive practice without the dangers of real-world situations.[1]	
7.	**Human Patient simulator:** A Human Patient Simulator (HPS), also known as a high-fidelity manikin, is a life-size, computer-controlled device that mimics human physiology and appearance to provide a realistic simulation of patient care scenarios. These simulators are used in healthcare education and training to help students and professionals practice critical skills, make clinical decisions, and develop teamwork.	
8.	**Standardized patient:** A standardized patient (SP) is a trained individual who acts as a simulated patient in healthcare settings, particularly for training and assessment. They are carefully trained to portray a specific case based on a real patient's medical history, symptoms, physical findings, and personality, allowing medical professionals to practice and be evaluated on their clinical skills.[1]	
9.	**Integrated models:** Enhance learning and skill development by incorporating various simulations into the curriculum, like high-fidelity mannequins, standardized patients, and low-fidelity simulators, to replicate real-world clinical scenarios.	
10.	**Virtual Reality:** The incorporation of virtual reality as a simulation tool is emerging. In healthcare, virtual reality simulation creates a realistic learning and assessment scenario using computers and standardized patients.[1]	
11.	**E-learning** (often knowledge assessment, such as multiple-choice exams): Simulations created by computers are models of tasks or situations that are used to aid in learning. These can be as simple as a computer software that shows how a machine, like an anaesthesia machine, works or as complex as a comprehensive virtual reality scenario where participants have conversations with simulated patients or other medical personnel.[1]	

12.	**Hybrid Simulation**: In order to create a more realistic simulation experience, two or more simulation types are merged to create this kind of simulation. The use of portable equipment by standardized patients, which allows students to carry out specific procedures while associating with a real person, is a common example. To provide the student the chance to get informed permission, explain the process, etc., a standardized patient can, for instance, place a suture training model (cushion) on his or her arm so the trainee can suture a wound.[1]	



IV. Structure of Simulation



1. **Pre briefing:** It is a process involving the preparation and briefing activities of a simulation-based experience. It refers to activities prior to the start of the simulation scenario. Usually lasting 10 to 12 minutes, this introduction phase explains the "why" and "how" of the entire simulation process. It begins with creating a secure and supportive learning environment for students. Taking introductions and extending a warm welcome to students facilitates this. By explaining the simulation's ground rules and

learning objectives to the pupils, anxiety can be reduced. The facilitator should provide hand-holding of items, equipment and the setting, as well as orientation to the simulators and standardized patient. Following that, the learners should be allocated roles and the case ought to be explained.[2]

2. **Simulation Scenario:** It alludes to a particular set of situations or settings that a simulation model or exercise is intended to handle. It provides a narrative framework for training or analysis by outlining the activities, events, and possible consequences that are being simulated. Students act out the roles they assumed at the pre-brief during this action phase. In order to handle the given instance, they use all of their cognitive, psychomotor and decision-making abilities while engaged in the "real" scenario. The facilitator can utilize "actors," "lifesavers," or "cues" if there is a divergence or issue in the scenario, but they should not interfere in the students' performance. Depending on the learning goals to be met, this phase may span five to ten minutes.[2]

3. **Debriefing:** This process is usually supervised by a facilitator. It is an essential component of simulation-based learning, which aims to assist students in converting experience into insightful contemplation and education. In order to find learning gaps and enhance performance in the future, participants in simulations discuss and evaluate their actions and mental processes during a simulated experience. Eighty percent of learning occurs during the reflective learning phase, which is how students learn. Depending on the simulation's goals, the learners' backgrounds, and the debriefer's experience, it should last at least three times the scenario time and no more than 45 minutes. In a learner-centred discussion with a facilitator present, debriefing involves students reflecting on their performance and attempting to identify any gaps. It provides analysis of students' responses, behaviour, and mental states regardless of how good or bad performance they have, and it assists in modifying students' behaviour in the next scenario by altering their mental states.[2]

   If available, students might benefit from reflective learning during the debriefing by seeing a video recording of the scenario conducted.

3(a). Reaction Phase: After arranging the table for the students, the facilitator asks open-ended questions such as "How did it feel to be in that situation?" to let them express their emotions. or “How are you feeling?" This is carried out to ensure that the students are shedding their roles and that their minds are clear before they participate in the conversation in the following stage. Students' nervousness is also reduced, and they feel more comfortable talking in a non-judgmental and non-threatening setting. Possible follow-up inquiries include "why you were feeling like that" and inquiries about other people's responses. To ensure that everyone seated at the table is aware of what transpired in the simulation scenario, learners are also requested to recount the events that occurred during the "real" scenario.

3(b). Analysis Phase: This is the most important stage of the debriefing process. The facilitator uses the double loop learning method to determine the "why" underlying the learners' behaviours. To get the students to think about "what and why the things happened the way they happened," "what it could lead to," and "what can be done next time," open-ended questions are used. Instead of pointing out students' performance shortcomings the facilitator ought to guide the conversation in a non-judgmental manner while leaving his or her views on the table to help students identify their own performance gaps. Finding performance gaps is simply one aspect of debriefing; other aspects include recognizing students' strengths, determining "why" they behaved in certain ways, and determining "how" these appropriate behaviours will benefit their future work. The analysis phase can be navigated using a variety of discussion techniques, such as educator guided, learner guided, or educator guided with learner insight.

3(c). Summary Phase: The facilitator or the students summarize the debriefing after evaluating every action in light of the simulation's goals. The important thing to remember in this case is that the summary is not for the entire simulation process or the simulation scenario, but rather for the lessons learned during the analytical phase of the debriefing. Each student then provides a takeaway message that they might use in their subsequent clinical practice.

V. Advantages & Disadvantages of Simulation

ADVANTAGES	DISADVANTAGES
• It does not harm the real patients. • Provides instantaneous feedback. • An encrypted environment. • Minimizes necessity for clinical settings. • Can be carried out repeatedly until the pupil has mastered the ability.[2]	• Can be expensive. • Cannot duplicate every aspect of a therapeutic setting. • Need simulation-trained nursing faculty • Might result in students learning inaccurate information if it is of low quality.

VI. Conclusion

Simulation is a technique that may be made to mimic real-world circumstances, which offers the chance to perform tasks in environments that are more accurate and representational of actual ones. There are certain importance of simulation in the teaching methodology and are various types of simulation which includes low fidelity simulations, medium fidelity simulations, high fidelity simulations, Screen/PC-based simulation, virtual patients, partial task trainers, human patient simulator, standardized patient, integrated models, virtual reality, e-learning and hybrid simulation. Application of simulation in nursing is well structured and are having various advantages and disadvantages.

REFERENCES

1. K Koukourikos*, A Tsaloglidou1, L Kourkouta1, et.al., Simulation in Clinical Nursing Education. ACTA INFORM MED. 2021 Mar;29(1):15–20. doi: 10.5455/aim.2021.29.15-20
2. Rebecca Munday. Types of Simulation in Nursing Education. Nurse journal
3. F Benchadlia1,*Q Rabia1 and K Abderrahim. Research Article: Simulation in Basic Nursing Student Education: Uses and Barriers. The Open Nursing Journal, Crossmark.2023, Volume 17. 1-8.
4. E Eyikara, Z G Baykara.,The importance of simulation in nursing education. World Journal of Educational Technology- Current Issue. Issue 10. Vol 9 No 1. 2017 January.02–07.
5. Kaur A, Dr. Kalia. A Review article: All about Simulation in Nursing: The Indian Scenario. Bulletin Environmental Pharmacology. Life Science., Special Issue [4] November 2022 : 190-197
6. M Aebersol. Simulation-Based Learning: No Longer a Novelty in Undergraduate Education; The Online Journal of Issues in Nursing; Volume 23;May 2018;1-11.