Lived Experiences Of Undergraduate Nursing StudentsRegarding Simulation-Based MasteryLearning

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Abstract
Themasterylearningstrategyisapotentteachingmethodinterms of enhancing the cognitive and psychomotor abilities of nursing students.Simulation has a significant impact on healthcare education across disciplinesandinbothundergraduateandpostgraduatestudies.Hence,investigatorsdecidedtoimplementthesimulation-basedmasterylearningapproach as a teaching method for first-yearB.Sc. (N) students. Topics thathavecorenursingskills,suchashealthassessmentare taught to them using high-fidelity simulation-based masterylearning. However, before proceeding to another subject and skill, investigatorsthought it was necessary to check the learners' experiences as this is the newmethod of teaching and learning.
Methodology *Aqualitative study design was undertaken to find out the lived experience of undergraduate nursing students regarding simulation-based mastery learning. Twenty-five students participated throughrandom selection. An individual student interview was conducted with the helpof a semi-structured interview schedule. All the interviews were audio recorded anda transcriptionforeachwasprepared.ThethemeswereextractedbyusingColaizzi'smethodofqualitativedataanalysis.*
Discussion:*Undergraduatestudentsexpressedthatthesimulation-based mastery learning approach is a valuable teaching and learning method andit enhanced theirskillsandknowledge in a safe place.*
Keywords:*Lived experience, Undergraduate nursing students, Simulation-basedmasterylearning (SBML)*

I.   Introduction:

A process ofexperiential learning that provides a safe environment for learning, preventing the risk of patient harm is called simulation. An experience using full-scale computerized patient simulators that provide a high level of interactivity and realism for the learner is called high-fidelity simulation (NLN-SIRC, 2013). The simulation as it relates to nursing education specifies a level of fidelity in which a realistic representation of a simulated environment exists.(1). Simulation-based mastery learningfeaturing deliberate practicegives residents and fellows the opportunity for procedural skills development and feedback. Mastery learning requires that learners meet or exceed a minimum passing score (MPS) on a simulated examination before performing the procedure in actual clinical care.(2)Simulation-based mastery learning (SBML) is an intense form of competency-based learning performed on a mannequin in which all learners are required to meet or exceed a minimum passing standard (MPS) on a knowledge-based examination and/or skills checklist before completion of training.(3)

Heather MacLean, Katherine J. Janzen, and Simoné Angus (2019) did a study on Lived Experience in Simulation: Student Perspectives of Learning, they stated thatin a mid-sized Canadian university, 98 second-yearBachelor of Nursing Students were invitedto a 4-hour immersive simulation session with 13 clinical groups of seven to eight students. Instead of an 8-hour clinical day in the hospital setting, students participated in a 4-hour simulation experience involving two different clinical scenarios, each debriefed separately by a team of faculty experienced in simulation. This has revealed important findings of students' lived experience in simulation. Regardless of role assignment, a supportive learning environment was key for student's learning. The areas were identified to improve the level of support in simulation in individual facilitation and debriefing practices by faculty, consistency among actors involved in simulation, and the inclusion of clinical instructors as part of the SCE. (4)

A similar study done by **Jessica Mulli, and Lorelli Nowell et al (2022),** on undergraduate nursing simulation facilitators, lived experience of facilitating reflection-in-action during high-fidelity simulation: A phenomenological study. In this study,11 semi-structured interviews and Colaizzi's seven-step process of

analysiswere used to discover the essence of undergraduate nursing simulation facilitator's use of reflection-in-action during high-fidelity simulation. Simulation facilitators were able to identify reflection-in-action during high-fidelity simulation when the students paused, collaborated, shared their thinking aloud, and changed their course of action. Barriers to this included learner's fear and anxiety, poor simulation design, and inadequately prepared students and facilitators. Simulation facilitators supported reflection-in-action through briefing, facilitator curiosity, and providing cues, prompts, and facilitated pauses. A few benefits to reflection-in-action included promoting collaborative learning, building confidence and critical thinking, and embedding reflection into practice. (5)

A study conducted by **Roghaye Mehdipour-rabori, Behnaz Bagheryan, and Monirsadat Nematollahi (2021)**, on Simulation-based Mastery Improved Nursing Skills in BSc Nursing Students: A Quasi-experimental study. In this study, clinical education is an essential part of nursing education, and selected clinical teaching methods influence it. A quasi-experimental study with two groups (the control and intervention) was conducted to assess the effect of simulation-based mastery learning on the clinical skills of undergraduate nursing students with a duration of the year 2017 to 2019. Simulation-based mastery learning was used to improve clinical skills among nursing students and provided an easy way to enhance nursing skills. After receiving written consent, with a random convenience sampling technique 100 B.Sc.(N) students were selected for the study. The intervention group participated in a simulation-based mastery learning intervention, and the control group received traditional training. The students of both groups completed the demographic information questionnaire as well as the pre and post-checklist of intervention. As per the result pre interventional data shows no significant differences between the two groups. Student's performance in the intervention group and control group improved significantly at the post-test compared to the baseline, implying that the simulation-based mastery model of the intervention groupwas significantly more effective as compared to that of the control group. The study findings showed that the mastery learning strategy improved the clinical skills of undergraduate nursing students. The results suggest that other nursing and health profession programs can develop a successful mastery-based learning model and can use this model in their day-to-day practice.(6)

Aim:
The purpose of the study is to explore the lived experiences of undergraduate nursing studentsregarding simulation-based masterylearning.

Objective:
Todescribethelivedexperiencesofundergraduate   nursing   studentswhoareengagedinsimulation-basedmasterylearning.

Problemstatement:
Lived experiences of undergraduate nursing students regarding simulation-based masterylearning: A Phenomenological study.

Researchquestion:
What are the lived experiences of undergraduate nursingstudents regarding simulation-based mastery learning?

Operationaldefinitions:
Experience: Exposure of undergraduate nursing students to simulation-based mastery learning.
Undergraduate Nursing students: Nursing students who have enrolled fora B.Sc. (N) course in a first-yearprogram.
Simulation-based mastery learning: This is an educational approach that is used to facilitate learning. Students were given objectives &and scenarios to perform skills on health assessment. The teacher decided the competency level that the learner expected to attain. The evaluation checklist was discussed with students, if students did not perform according to the decided competency level repetition of skills was allowed till the students gained the decided competency level.

InclusionCriteria:
1. Undergraduate nursing students whoareexposed tosimulation-basedmasterylearning.

ExclusionCriteria:
1. Undergraduate nursing students whoarenot willingtoparticipateinthestudy.
2. Undergraduate nursing students whoremained absent during the sessions of simulation-basedmasterylearning.

II. Methodology:

For the present study, a qualitative research approach was adopted.The samplesizeof thisstudywas25 first-year B.Sc. (N) students who were selected through a simple randomprobability sampling method.The faculty divided a topic on health assessment into small units. Each subunit has objectives and a criterion checklist to assess skills. For each subunit, objective-based teaching (theory and demonstration) was done by the faculty. After each subunit,the students were assessed for their skills based onthe criterion-based checklist. Immediate feedback on the student's performance was given. Students have improved their skills in health assessment. A summative assessment was performed in the form of OSCE/ OSPE. After the summative test by the lottery method, 25 students out of 48 were selected for interview.

Population:

First-year B.Sc. (N) 25 students had completed their simulation-based mastery learning session and were exposed to clinical learning. Their willingness and consent to participate in the study were ensured.

Sampling:

A random sampling technique was used. The participants were selected to share their knowledge and experience with the researchers on simulation-based mastery learning. All the participants were females of the 18-22 years age group. The interviews were audiotaped.

Data Collection:

Consent from each participant was obtained for the study. After obtaining the consent, teaching the topicofHealth Assessment was performed through a simulation-based mastery learning approach. After completion of the mastery learning teaching process, the interview was conducted, verbatim was recorded and transcription was prepared. In-depth interview data was collected from the first B.Sc. (N) students on lived experiences ofsimulation-based mastery learning, which lasted for 15-20minutes. Due care was taken while collecting the data on pitch, tone, voice, and modulation of participants, andmaintained the notes along with minutes observations during the interview. Open-ended questions were used andmaintained in the interview guide. The first B.Sc. (N) students have shared the experiences genuinely and with openness. The followingquestionsaskedfor the interviewwere:

1.Did you find any difference between the traditional method and the simulation-based mastery learning method?
2. Do you think the experience you had is adequate for you?
3. Have you received adequate time to learn?
4.Are teachers sensitive to your learning needs?
5. What challenges didyou face during learning by simulation-based mastery learning method?
6. Can you suggest how you can overcome these challenges?

Based on the proximity of the narrative experiences, the data underwent analysis and were categorized into the following themes:

Themes -1Active StudentEngagement:

Students reported a heightened focus on achieving learning outcomes and becoming more consistent learners.Various teaching methods contributed to a clearer understanding of concepts.Peer tutoring was effective, and hands-on simulator practice enhanced communication skills and critical thinking.Activity-based learning played a role in boosting confidence.

Themes2-Collaborative Teaching-Learning Environment:

Teaching occurred through collaborative interactions, providing a conducive environment for addressing learning-related queries.Formative assessments after each unit prepare students for future exams.Criterion reference testing reduced exam-related anxiety, fostering simultaneous progress within the group.Teacher-student interactions contributed to increased student confidence.

Themes 3- Effective Development of Procedure Skills:

Multiple practical sessions allowed students to apply theoretical knowledge in an educational context.Exposure to practical experiences enhanced students' perceptions of being actively involved in their learning.

Themes 4- Building Confidence:

Repetition of practical steps appeared to enhance students' confidence in developing their skills.

Themes 5- Sense of Satisfaction:

Simulation-based mastery learning provided adequate time for self-study and group study.Students expressed satisfaction with the method, feeling motivated and actively engaged in their learning.

Themes 6- Realistic Cases:

Simulations based on real clinical situations were perceived as relevant and realistic by participants.

Theme 7 – Safe Learning:

Simulation based learning was perceived as a safe space for the students. They expressed that they could repeat the procedure numerous time without the fear of hurting the patient as in real situation.

Table: 1 Themes

SR.NO	THEMES	RESPONSE
1	Active student engagement	-*"I actively participated as the mannequin gave a realistic experience."* - *"I was active during mastery learning and developed an interest in peer tutoring on the dummy."*
2	Collaborative teaching-learning environment	-*"Easy to understand; sufficient time after sessions for tests and study."* -*"Teacher cleared doubts and guided me."*
3	Effective in developing skill procedures.	- *"I can do the procedure on my own; gained knowledge and confidence."* - *"Practical part helped in skill development."*
4	Build confidence	-*"Mastery learning (ML) provided a good foundation for confidence and knowledge."* *"I feel confidentincommunicationandpracticalskills"* *"This method improves our confidence level because we lack confidence, but this problem is solved easily through mastery learning."* *"This technique was effective to me, to build my skill and confidence."* *"During this learning, mylevel of understanding has improved"*
5	Sense of Satisfaction	*"In this method, I got adequate time for learning and improving my knowledge and skills."* *"I got good experience in improving my skills, so it helped me to score good marks in the test conducted after each session. This method is helpful for the final exam."* *"It was an advantage to me, as it had a lot of interesting facts and methods."* *"I got adequate time to study because after the lecture teacher gave us adequate time to study for a test."*
6	*Realistic cases*	*"It was like a live situation."* *"The new mannequin which was introduced in our demonstration lab that we could demonstrate and hearnormal and abnormal heart sounds, lung sounds, and bowel sounds.*
7.	*Safe Learning*	*"In performing the procedure, the dummy gave me safe and realistic experience because of which I was able to assess heart rate, pulse rate, bowel sound, etc. and in traditional method this was not possible. This is more effective than traditional method."* *" I could repeat the procedures numerous times till I became confident without the fear of hurting the patient as I performed it on the mannequin"*

Challenges faced:

1. The new mannequin posed challenges in the beginning due to its realism, leading to performance anxiety.
2. Acquiring numerous skills within a short duration presented a challenge.

Limitations:

1. The study involved a limited sample of 25 respondents.
2. It employed a descriptive research design.

Ethicalconsideration:

The researchers have obtained the Institute Research Committee's approval. Informed consent was obtained from eachundergraduate nursing student. Privacy and confidentiality were maintained. Interview data and transcripts were stored with theresearcher.

III.   Discussion:

This study aimed to explore the lived experience of undergraduate nursing students in simulation-based mastery learning. Data was gathered through interviews of participants, observation of researchers, and transcribed audio recordings. Through the coding of the data, seven themes came up, the learnersemphasized the importance of authentic and recognizable scenarios. They described their experiences; during the scenarios

of health assessment, the mannequingave us a realistic experience in the sense we could hear abnormal heart sounds and bowel sounds, and this experience was very positive in theirlearning. They acknowledged, that somescenarios presented an opportunity for them to focus on collaboration and communication. Further, the students reportedthat simulation-based mastery learning (SBML) helped them in gaining confidence and preparedness for future work. Ithelped them to learn both concepts and application in a nuanced way to tackle an unforeseen situation.The results of the study supported that participating in the scenarios led to active participation, collaboration, skill development, with confidence, and sense of satisfaction. They also expressed that they felt as if they were in a realistic safe space without the fear of harming the real patient.A study conducted by Karoline Skedsmo, and Hannah Maria Bingen etal, 2023, (7) on post graduate nursing students' simulation based learning in palliative education explored the students' experiences with simulation-based learning focusing on communication skills, as a learning method in palliative care education.Postgraduate palliative care nursing students seemed to experience anxiety towards simulationbased learning and this could be due to their unfamiliarity with the learning method. The need for repetition was underlined and the students indicated that they would like to be able to participate in several simulation sessions to familiarize themselves with the approach. The contrast between being a skilled professional in everyday life and the pressure of being observed and judged in the scenarios was an important finding. Students outlined the desire to feel safe, but also highlighted the importance of being challenged to experience professional development and enhanced mastery. This findings were different to our findings as our students were undergraduates and they were in a familiar place with their teachers and they did not experience similar anxiety of being judged by unknown faculty. Simulation-based mastery learning helps students to learn in a safe supportive environment and gain experience with conditions that they may encounter during clinical practice. Simulation-based learning is often referred to as a safe learning environment; however, the safety in focus is often the patient, not the learner. Safety in this context may be both psychological safety and academic safety. Academic safety is that the student has no risk of academic failure, negative judgment by faculty or peers, loss of integrity, or embarrassment. (Ganley and Linnard-Palmer, 2012) (8). Our study also showed the safety aspect of undergraduate students. The students felt safe to repeat the procedures numerous time without the fear of hurting real patients in the simulation lab.A psychologically safe environment is one where students feel comfortable to take risks without fear of negative consequences. When a student feels psychologically safe in simulation, he/she is more likely to engage in the experience and reflect on their own and others' performance. An environment characterized by psychological safety is one where students feel free to take risks without fearing negative consequences (Stephen et al., 2020). (9). Our study students too expressed similar psychological safety. A study done by Jacqueline O'Flaherty [a], Maurizio Costabile2020, using a science simulation-based learning tool to develop students' active learning, self-confidence, and critical thinking in academic writing reported a positive learning experience, an increase in self-confidence to critically appraise a case study, and greater student success in two assessments for student's participating in the simulation compared to students who only used lecture notes as a study tool. In our study, similar themes revealed active student engagement, self-confidence, and sense of satisfaction with acquisition of theoretical and procedural skills.(10) A study by Guillaume Alinier & Denis Oriot 2022,on Simulation-based education: deceiving learners with good intent concluded that, Simulation-based education is often used for learners to become more proficient in handling real-life situations. For this reason, some level of realism is required to ensure appropriate assimilation of skills and knowledge and transference of learning to real clinical practice. (11) Students in the present study expressed that they had realistic experience with simulation and the mannequin gave them confidence to repeat the procedures till they mastered them.

IV.   Conclusion:

In this study, the result supported that, the undergraduatenursing studentsexpressedthatthesimulation-based mastery learning approach is a valuable teaching method and is an effective methodology for skilled-based competency. Thiscanbe used toenhance theirskillsandknowledge.

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References:

[1].   Shannon L. Hanshaw, Suzanne S. Dickerson, 2020. High Fidelity Simulation Evaluation Studies In Nursing Education: A Review Of The LiteratureVolume 46, July 2020,Doi.Org/10.1016/J.Nepr.2020.102818 Https://Www.Sciencedirect.Com/Science/Article/Abs/Pii/S1471595319307954

[2].   Elaine R Cohen, Jeffrey H Barsuk, Et.Al, 2012 Simulation-Based Education With Mastery Learning Improves Paracentesis Skills 2012 Mar; 4(1): 23–27.Doi: 10.4300/Jgme-D-11-00161.1pmcid: Pmc3312528 Pmid: 23451302

[3].   Jeffrey H Barsuk , Jane E Wilcox , Elaine R Cohen , Et.Al, 2019. Simulation-Based Mastery Learning Improves Patient And Caregiver Ventricular Assist Device Self-Care Skills, A Randomized Pilot Trial, Volume 12, Issue 10: E005794, Originally Published October11,2019, Https://Www.Ahajournals.Org/Doi/10.1161/Circoutcomes.119.005794

[4].   Heather Maclean, Katherine J. Janzen, Simoné Angus 2019, Lived Experience In Simulation: Student Perspectives Of Learning

From Two Lenses Clinical Simulation In NursingVolume 31, June 2019, Pages 1-8 Https://Doi.Org/10.1016/J.Ecns.2019.03.004

[5].   Jessica Mulli, Lorelli Nowell, Ruth Swart, Andrew Estefan, February 2022, Undergraduate Nursing Simulation Facilitators Lived Experience Of Facilitating Reflection-In-Action During High-Fidelity Simulation: A Phenomenological Study Volume 109, 105251 – Science Direct Https://Doi.Org/10.1016/J.Nedt.2021.105251

[6].   Roghaye Mehdipour-Rabori, Behnaz Bagheryan, Monirsadat Nematollahi 2021, Simulation-Based Mastery Improves Nursing Skills InBsc Nursing Students: A Quasi-Experimental Study 2021 Jan 6;20(1):10. Doi: 10.1186/S12912-020-00532-9.Simulation-Based Mastery Improves Nursing Skills In Bsc Nursing Students: A Quasi-Experimental Study - Pubmed (Nih.Gov)

[7].   Karoline Skedsmo, And Hannah Maria Bingen Et.Al, 2023, Postgraduate Nursing Students' Experiences With Simulation-Based Learning In Palliative Care Education: A Qualitative Study. Nurse Education In Practice 73 (2023) 103832, Https://Doi.Org/1.0.1016/J.Nepr.2023.103832.

[8].   Ganley, B.J., Linnard-Palmer, L., 2012. Academic Safety During Nursing Simulation: Perceptions Of Nursing Students And Faculty. Clin. Simul. Nurse. 8 (2), E49–E57. Https://Doi.Org/10.1016/J.Ecns.2010.06.004.

[9].   Stephen, L.-A., Kostovich, C., O'rourke, J., 2020. Psychological Safety In Simulation: Prelicensure Nursing Students' Perceptions. Clin. Simul. Nurse. 47, 25–31. Https://Doi. Org/10.1016/J.Ecns.2020.06.010.

[10]. O'flaherty J, Costabile M. Using A Science Simulation-Based Learning Tool To Develop Students' Active Learning, Self-Confidence And Critical Thinking In Academic Writing. Nurse Educ Pract. 2020 Aug; 47:102839. Doi: 10.1016/J.Nepr.2020.102839. Epub 2020 Jul 22. Pmid: 32943173.

[11]. Alinier, G., Oriot, D. Simulation-Based Education: Deceiving Learners With Good Intent. Adv Simul 7, 8 (2022). Https://Doi.Org/10.1186/S41077-022-00206-3