

In Situ Simulation In Improving The Competency Of Health Care Professionals

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Abstract

Introduction: In situ simulation has evolved as a particular form of simulation, distinct from the simulation sessions conducted in a simulation center. In situ simulation allows teams to review and reinforce their skills and identify latent system gaps in the actual clinical environment. This study aims to assess the effectiveness of an in-situ simulation session to improve the competency level of midwives during the admission procedures at the antenatal, labor, and postnatal wards.

Setting & Design: Pre-experimental one group pre-test post-test design

Materials and Methods: A total of Thirty-five midwives posted in maternity wards got selected by a convenient sampling technique. The pre-test was conducted to assess their baseline knowledge. An initial pre-brief was followed by the immersive experience of a single patient admitted to the antenatal ward, delivered in the labor ward, and then admitted to the postnatal ward. Post debriefing post-test was conducted for all.

Results: Most midwives were competent in performing the necessary admission procedure (96.1% in antenatal, 88.46% in labor, and 88.46% in postnatal wards). The mean knowledge score for the post-test was 7.23 ± 1.416 when compared to the pre-test 5.86 ± 1.630 (highly significant value of $p=0.002$). There was a weak positive correlation between competency scores and post-knowledge scores of labor ward admission $r=0.205$, $p=0.316$, and postnatal admission $r=0.210$, $p=0.303$. There was a highly significant association between antenatal competency scores $p=0.008$ and the age of the participants.

Conclusion: The study reiterates that Situ simulation can be effectively used to improve the competency level of the midwives concerning hospital admission procedures, thereby improving the quality of care.

Clinical Significance: In-situ simulation is a very effective tool to use in the clinic to improve the skills and competency of the health team workers. It also provides a technique for identifying latent hazards in clinical systems.

Keywords: In Situ Simulation, midwives, Maternity wards, admission procedure, Health care profession

INTRODUCTION

Admitting a pregnant woman to the ward for inpatient care is a complex process that, unless carefully managed, can lead to long delays in service and a poor patient experience at the doorstep of the hospital. Waiting for the admission and paperwork or a bed to be assigned can be frustrating for pregnant women.¹ Hence, if the pregnant mother or the woman in labor pain needs admission to be considered quickly, waiting for a long time can make women emotionally and physically upset. Therefore, minimizing the emotional and physical difficulties of the

women is the responsibility of the admission midwife or a staff nurse. The midwife should be very skillful in mitigating the ease of others, so it is a new challenge to her profession. The midwife is expected to be an assertive person by bringing solutions to the problems and developing excellent care.²Midwifery profession is to establish communication both with the mother and with her family members directly or indirectly to serve them better and to ensure their comfort, health, happiness, and safety.^{2,3} At present, in the clinical setting, there are many new staff joined after their graduation for their clinical practice. These staffs are taken to a simulation laboratory for their orientation and training. During training, a need assessment is done and found that midwives need to be trained in the actual scenario (In-situ simulation).

In situ simulation enhances interdisciplinary teamwork by providing a good education strategy that promotes patient safety.^{4,5} In situ simulation helps the teams solve the clinical problem and reinforce their skills.⁶It is also used to expose and analyze barriers to implementing those skills in the patient environment.³When the teamwork skills are practiced and integrated into a time-pressured clinical setting, this is an effective tool in identifying latent threats and system issues that could compromise patient safety. In addition to practicing clinical skills, these interventions also offer teamwork/behavioral training.⁷

Thus, in situ simulation can identify gaps in training and areas for improvement.⁸Although, in the past 20 years, simulation has become more integrated into the education of nurses and physicians, it has not been as well integrated into the development of skills for practicing nurses. Therefore, this study aims to assess the competency level to improve the skills of a nurse.

METHODS AND MATERIALS

This study was a pre-experimental one-group pre-test post-test conducted among thirty-five⁸health care professionals. The study participants were midwives from antenatal, postnatal, and labor wards of the selected tertiary care hospital, Mangalore, India. Ethical clearance was obtained from the Institutional Ethics Committee (FMIEC/CCM/155/2020) and due permission was taken from concerned authorities in the hospital. Informed written consent was taken from the study participants.

The midwives were selected using a convenient sampling technique. All the midwives from the maternity units were enrolled as study subjects. Tools (Admission procedure to the antenatal, intranatal and postnatal wards) were prepared by the researcher after consulting the simulation educators and obstetricians for feasibility. Validation and reliability of the tool are done and found to be feasible. From the simulation center, a low-fidelity mannequin was shifted to the ward for the admission procedure. Subjects were introduced to the investigators and the purpose of the study was explained. The baseline variables and pre-test were introduced to the midwives. In accordance with their postings, groups were divided into antenatal, intranatal, and postnatal groups. During the briefing, the antenatal ward midwives were exposed to low-fidelity mannequins in their wards. They asked to perform the admission procedure by following the ward routines; at 15 minutes, the assessment stopped. As one group performed, the other two were observing. The same methodology was repeated for intranatal and postnatal admission procedures too. A classroom evaluation and debriefing was conducted after each group was exposed to the scenarios in their respective wards. Post-test questionnaires were given to all the midwives.

RESULTS

The study results show that 48.57% of the participants were in the age group of 26-30 years with a mean age of 27.66±3.369, 33.33% with mean clinical experience of 2.17±1.150 midwives were in the ≤2 years of range. The majority of the participants were competent while handling the patients in antenatal, intranatal, and postnatal admission procedures, which is depicted in table 1.

Table 1: Grading of Subjects according to their competency level

Sl no	Variable	Min Score	Max Score	Grading	f	%
1	Antenatal n=26	15	45	Competent (≥22)	25	96.1
				Non competent (<22)	1	3.84
2	Intranatal n= 26	14	42	Competent (≥21)	23	88.46
				Non competent (<21)	3	11.54

3	Postnatal n=26	15	45	Competent (≥ 22)	23	88.46
				Non competent (< 22)	3	11.54

Comparison of knowledge score

A comparison of knowledge score is depicted in table 2, which shows the knowledge score was improved in post-test 7.23 ± 1.416 while comparing the pre-test 5.86 ± 1.630 , obtained $t_{(34)} = 3.281$ with the p value $p = 0.002$, which is highly significant.

Table 2: Comparison of knowledge score

N=35

Variable	Score	Mean \pm SD	t test	p value
Knowledge score	Pre test	5.86 \pm 1.630	3.281	0.002**
	Post-test	7.23 \pm 1.416		

df=34, $p < 0.05$, ** highly significant

Co relation between knowledge score and competency scores

Table 3 shows a weak positive co-relation with intranatal and postnatal competency scores and post-knowledge scores

Table 3: Co relation between knowledge score and competency scores

N=35

Variable	Areas	r value	p value
Knowledge and competency score	Antenatal	-0.247	0.225
	Intranatal	0.205	0.316
	Postnatal	0.210	0.303

$P < 0.05$

There was no significant association between post-test knowledge score and demographic variables as the p values are > 0.05 . There was a highly significant association between antenatal competency scores and age of the participants as the p-value is $p = 0.008$, were as other variables, it was not found statistically significant. Overall, the program was appreciated by all the participants and advised for future classes

Discussion

The in-situ simulation was influential in the clinical scenario. The Present study reveals that the mean post-test score was improved while compared to the mean pre-test knowledge score. These findings were congruent to the study's conclusions conducted by Davison, M (2017) et al. They assessed the utility of a multiple-encounter in-situ (MEIS) simulation in emergency and inpatient service. In terms of their simulation role, most were participants (57%, $n = 51$), and the remaining were either observers (16%, $n = 14$) or facilitators (11%, $n = 10$). There was a significant improvement in post-intervention versus pre-intervention Likert scores for role confidence and orientation adequacy ($p = 0.001$ and < 0.001 , respectively).⁹

In situ simulation proved adequate to orient new staff to admission procedures. Lee's study found significant improvement in the staff's orientation and confidence in dealing with scenarios in the unique setting.¹⁰ There is evidence of in-situ simulation; the expected outcomes explored were the changes in teamwork and confidence levels in the specific specialty. Studies on resuscitation found increased confidence with arrest issues.¹¹

Clinical Significance

In situ simulation supports experiential learning, frequent skill reinforcement, and identification of latent safety threats. It has also proved helpful in various specialties for skills improvement and better team understanding, with the flexibility to meet both local and organization needs and priorities. In situ use is particularly relevant to high acuity places such as emergency departments, operating rooms, and critical care units. Many factors may influence the in-situ simulation outcome, like location, timing, notification, and participants' level of competency and

engagement. The more standardized and controlled elements, the more valuable data from simulation exercises become. Thus, insitu simulation can be used as an essential modality for medical education and training

Limitation of the Study

This study is conducted in single setting and specialty.

Conclusion

In situ simulation is a relatively new and rapidly evolving tool. It helps to identify the latent hazards and knowledge gaps with the potential to improve patient safety. In situ simulation strengthens the communication, teamwork, and technical skills critical to high-functioning health care teams. If health personnel overcome the challenges, it will yield a rich return in benefits for improved patient safety.

Lessons for Practice

- According to emerging research, in situ simulation can improve organizational and system-level processes, as well as address individual and team development.
- Learning outcomes can be assessed in situ using simulation, which helps learners identify continued education needs more clearly.
- In-situ simulation improves the skills of the midwives and help to identify their own drawbacks and realization of the faults.
- In-situ simulation offers safe and creative learning opportunities by using the real environment, resources, time and space.

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