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Effect of Simulation-Based Training on Nursing Students' Behavioral Competence in Postpartum Hemorrhage Management: A Blended Study with an Emphasis on Student Perceptions-Pilot Study

P. Uma

M.Sc (N), OBG, Ph.D Assistant professor, Nehru College of Nursing and Research Institute, Coimbatore

Abstract: ***Postpartum hemorrhage remains a major contributor to maternal morbidity and mortality, particularly in low- and middle-income settings, despite ongoing improvements in maternal health services. Strengthening the preparedness of nursing students is therefore essential, as they play a critical role in early recognition and timely management of obstetric emergencies. This study examined the effectiveness of simulation-based training on the behavioral competence of nursing students in managing postpartum hemorrhage, with specific attention to knowledge, practical skills, self-confidence, and decision making. A sequential explanatory mixed method design was adopted, combining a quasi-experimental pretest posttest approach with qualitative exploration of student perceptions. Thirty undergraduate nursing students from selected nursing colleges in Coimbatore, Tamil Nadu, participated in the study. Structured questionnaires, an objective structured clinical examination checklist, and open-ended interviews were used for data collection. Post intervention findings showed marked improvements across knowledge levels, practical skills, and efficacy scores, with statistically significant differences between pretest and posttest measures. Qualitative insights further highlighted improved confidence, clearer role understanding, and better integration of theoretical knowledge into clinical practice. Overall, the findings demonstrate that simulation-based training is an effective educational strategy for enhancing behavioral competence in postpartum hemorrhage management and supports its integration into undergraduate nursing curricula to improve maternal care outcomes.***

Keywords: postpartum hemorrhage, simulation-based training, nursing education, behavioral competence, maternal health

1. Introduction

Postpartum hemorrhage (PPH) is recognized as one of the leading causes of maternal morbidity and mortality worldwide, particularly in developing countries like India. According to the National Family Health Survey **(NFHS-5, 2019-2021)**, Tamil Nadu has made significant strides in reducing maternal mortality, yet PPH continues to pose a substantial risk during childbirth **(Government of India, 2021).** Effective management of PPH is crucial for improving maternal health outcomes, which necessitates thorough training for healthcare professionals, especially nursing students who are often on the frontline of maternal care.

Simulation-based training has emerged as a transformative educational approach in nursing, allowing students to engage in realistic clinical scenarios in a controlled environment. Research by **Kumar et al. (2020)** highlighted that simulation enhances not only technical skills but also critical thinking and teamwork among nursing students in Tamil Nadu. This aligns with the findings of Ghosh and Parikh (2019), who noted that simulation training significantly improves students' confidence and competence in managing emergencies, including PPH.

Postpartum hemorrhage (PPH) is commonly defined as a blood loss of 500 ml or more within 24 hours after birth and is one of the most common obstetric crises that can harm both the mother and infant. Worldwide, PPH accounts for 25% of maternal mortality. Prompt recognition and response to PPH are crucial in preventing maternal morbidity and mortality. The literature identified that simulation and team training significantly improves PPH response time among clinically experienced community labor and delivery teams (**Marshall et al., 2015**).

Postpartum hemorrhage (PPH) is a frequent complication of delivery and its incidence is commonly reported as 2-4% after vaginal delivery and 6% after caesarean section with uterine atony being the cause in about 50% cases. PPH remains the number one killer of mothers and accounts about 28% of all maternal deaths in developing countries. Multiple studies have suggested that many deaths associated with PPH could be prevented with prompt recognition and more timely and adequate treatment.

Simulation is particularly helpful in preparing teams to recognize and manage PPH because of existing bundled approaches that show a clear path to treatment and allow for more vigorous formative or summative evaluation. The PPH bundle approach comprises uterotonics, tranexamic acid, isotonic crystalloids, and uterine massage. Additionally, the PPH bundle consisted of compressive measures (aortic or bimanual uterine compression), the nonpneumatic antishock garment, and intrauterine balloon tamponade (IBT). The other PPH bundle supporting elements are advocacy, training, teamwork, communication, and the use of best clinical practices (**Althabe et al., 2020)**.

The significance of this study lies in its evaluation of the effectiveness of simulation- based teaching in nursing education. By conducting a systematic review of the literature, this study provides valuable insights into the impact of simulation-based training on nursing students' clinical skills, knowledge, reasoning abilities, clinical decision-making, and patient outcomes. The findings of

this study can inform educators, curriculum developers, and policymakers in nursing education to make informed decisions regarding the implementation and integration of simulation- based teaching methods **(Koukourikos., 2021)**

Simulation-based training has demonstrated its effectiveness in enhancing clinical decision-making and patient outcomes Simulation-based training improved nursing students' clinical decision making capabilities and facilitated the application of theoretical knowledge in practical clinical settings However, a study has shown that simulation- based training has the potential to be cost effective in the long run, as it reduces medical errors, improves patient outcomes, and improves nursing students' readiness for clinical practice **(Awang-Harun et al., 2022)**.

2. Statement of the Problem

Effect of simulation-based training on nursing students' behavioral competence in postpartum hemorrhage management: a blended study with an emphasis on student perceptions.

3. Objectives of the Study

Primary objectives (Before the Intervention):

1) To assess the critical thinking of nursing students regarding management of postpartum hemorrhage
2) To find out the competency skills of nursing students regarding management of postpartum hemorrhage.
3) To design and develop simulation based training package on management of postpartum hemorrhage .
4) To explore the perceptions of the nursing students regarding management of Postpartum Hemorrhage

Secondary objectives (After the Intervention):

1) To execute simulation based training package on management of postpartum hemorrhage.
2) To determine the effectiveness of simulation- based training package on behavioral outcomes regarding management of postpartum hemorrhage among nursing students.
3) To evaluate the association of behavioral outcomes regarding management of postpartu hemorrhage among nursing students.
4) To determine the co-relation of behavioral outcomes regarding management of Postpartum Hemorrhage among nursing students.

Hypothesis

Hypothesis will be tested at 0.05 level of statistical Significance:

H01: There will be no significant difference between mean Pre-test and post-test knowledge scores of behavioral competence regarding management of postpartum Hemorrhage

H1: There will be a significant difference between mean Pre-test and Post-test knowledge scores of behavioral competence regarding management of postpartum Hemorrhage after attending simulation-based training program than before attending it.

H02: There will be no significant difference between mean Pre-test and Post-test practice score of behavioral competence regarding management of postpartum Hemorrhage after attending simulation-based training program than before attending it.

H2: There will be a significant difference between mean Pre-test and Post-test practice score of behavioral competence regarding management of postpartum Hemorrhage after attending simulation-based training program than before attending it.

H03: There will be no significant difference between mean Pre-test and Post-test self- confidence score behavioral outcomes regarding management of postpartum Hemorrhage after attending simulation-based training program than before attending it.

H3: There will be a significant difference between mean Pre-test and Post-test self- confidence score behavioral outcomes regarding management of postpartum Hemorrhage after attending simulation-based training program than before attending it

H04: There will be no numerous factors that may influence understanding and decision making in managing postpartum Hemorrhage among nursing students.

H4; There will be a numerous factors that may influence understanding and decision making in managing postpartum Hemorrhage among nursing students.

H05: Three will be no indepth understanding of factors influencing decision making and clinical performance in managing postpartum Hemorrhage among nursing students

H5: Three will be no indepth understanding of factors influencing decision making and clinical performance in managing postpartum Hemorrhage among nursing student

4. Research Methodology

Research approach: Quantitative and Qualitative research approach

Research design: Sequential explanatory mixed method design
Quantitative- quasi experimental, pre test post test design
Qualitative- Descriptive qualitative design

Population: In this study population consist of 30 students

Targeted population: In this study targeted population consist of students studying in the selected educational institutes.

Accessible population: In this study accessible population consist of students studying in the selected educational institutes of coimbatore, Tamil Nadu.

Sampling technique:
Quantitative -Purposive sampling technique
Qualitative - Random sampling technique

Sample size: Students from B.Sc Nursing, a total sample size consists of 30
The power analysis used for the sample size calculation.

Operational definition:

Effect: In this study the word effect as the measurable change or difference observed in a specific variable or outcome.

Simulation-Based Teaching: Refers to the use of simulated scenarios, models, or virtual environments to provide nursing education and training. It involves the replication or representation of real-life clinical situations, allowing students to actively participate, make decisions, and practice their skills in a safe and controlled environment.

Behavioural outcomes: In this study the word behavioural outcomes refer to students' cognizance, perception and practices

management of postpartum hemorrhage: "management of postpartum haemorrhage (PPH)" would involve clearly specifying the actions, protocols, or criteria used to assess how PPH is managed in a clinical or simulated setting. This could include specific measurable behaviors, procedures, or outcomes that indicate successful management of PPH.

Nursing Students: In this study, it refers to nursing students pursing 4th year B. Sc. Nursing studying in Nursing college recognized by State Nursing Council and affiliated to Indian Nursing Council. The nursing students who had their regular teaching on postpartum heamorrhage.

Perception: In this study, it refers to an individual's interpretation or understanding of a stimulus or situation, measured through self-reported surveys etc.

Inclusion criteria for sampling:

1) Students studying in the selected nursing colleges of Coimbatore.
2) Students who are willing to participate in the study
3) Students who are available during the time of data collection
4) Both male and female students.

Exclusion criteria for sampling:

1) Students who are not studying in selected nursing colleges of Coimbatore.
2) Students who are not willing to participate in this study.
3) Students who are not available during the time of data collection.
4) Students who are emotionally and psychologically disturbed.

Variables under the study:

Independent variables: simulation- based training

Dependent variables: Cognizance, perception and practices of the students regarding simulation based traning on management of postpartum haemorrheage.

Extraneous variables: Personal characteristics such as age, gender, educational status, health history, previous knowledge, family income per month, dietary habits, type of family, previous simulation training program participation etc.

Tool:

Part-A: it consists of socio-demographic data of the participants under the study.

Part-B: It consists of Structured knowledge Questionnaire to assess the knowledge level regarding simulation- based training on management of postpartum haemorrhage among students in selected nursing colleges.

Part-C: It consists of open- ended interview questions for perception regarding simulation- based training on management of postpartum haemorrhage among students in selected nursing colleges.

Part-D: It consists of OSCE check list to assess the practices of students.

Table 1: Frequency and percentage wise distribution a study to effect of simulation-based training on nursing students' behavioral competence in postpartum haemorrhage management according to their demographic variables, (N=30)

Demographic variables	f	%
1.Age in years:		
18 years	6	20
19 years	8	26.7
20 years	10	33.3
21 years	6	20
2.Sex:		
Male	14	46.7
Female	16	53.3
3.Type of residential area:		
Urban	13	43.3
Rural	17	56.7
4.Type of family:		
Joint family	18	60
Nuclear family	12	40
5.**Religion**:		
Hindu	19	63.3
Muslim	4	13.3
Christian	7	23.3
6. Board of school education:		
State board	4	13.3
Matriculation	8	26.7
CBSC	13	43.3
ICSC	5	16.7
7. Programme of study:		
B.**Sc.** Nursing	12	40
GNM	18	60
8. **Previous exposure to the management of postpartum haemorrhage**		
Yes	14	46.7
No	16	53.3
9. If, yes source of exposure:		
Direct exposure at the hospital	4	28.6
Training at the lab	10	71.4

Section B:

Table 2: Frequency and percentage wise to effect of simulation-based training on nursing students' behavioral competence in postpartum haemorrhage management

Level of Knowledge	Knowledge score			
	Pre test		Post test	
	f	%	f	%
Moderate	22	73.3	19	63.3
Adequate	0	0	11	36.7
Overall	30	100	15	100

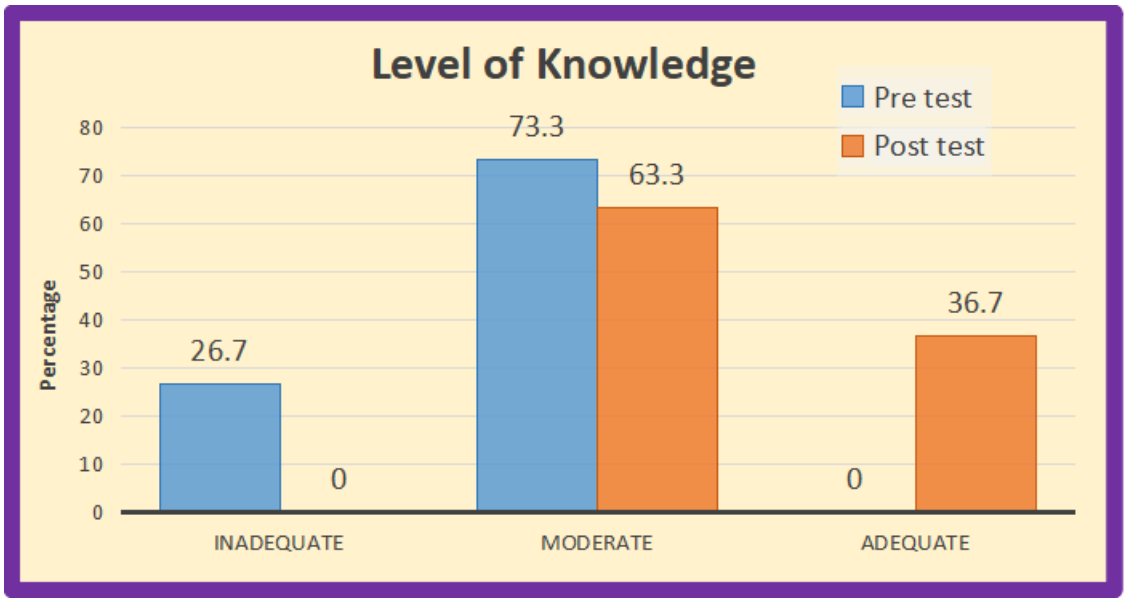

Table 3: Frequency and percentage wise to effect of simulation-based training on nursing students' behavioral competence in postpartum haemorrhage management.

Level of Practical skill	Practical skill score			
	Pre test		Post test	
	f	%	f	%
Inadequate	3	10	0	0
Moderate	27	90	17	56.7
Adequate	0	0	13	43.3
Overall	30	100	30	100

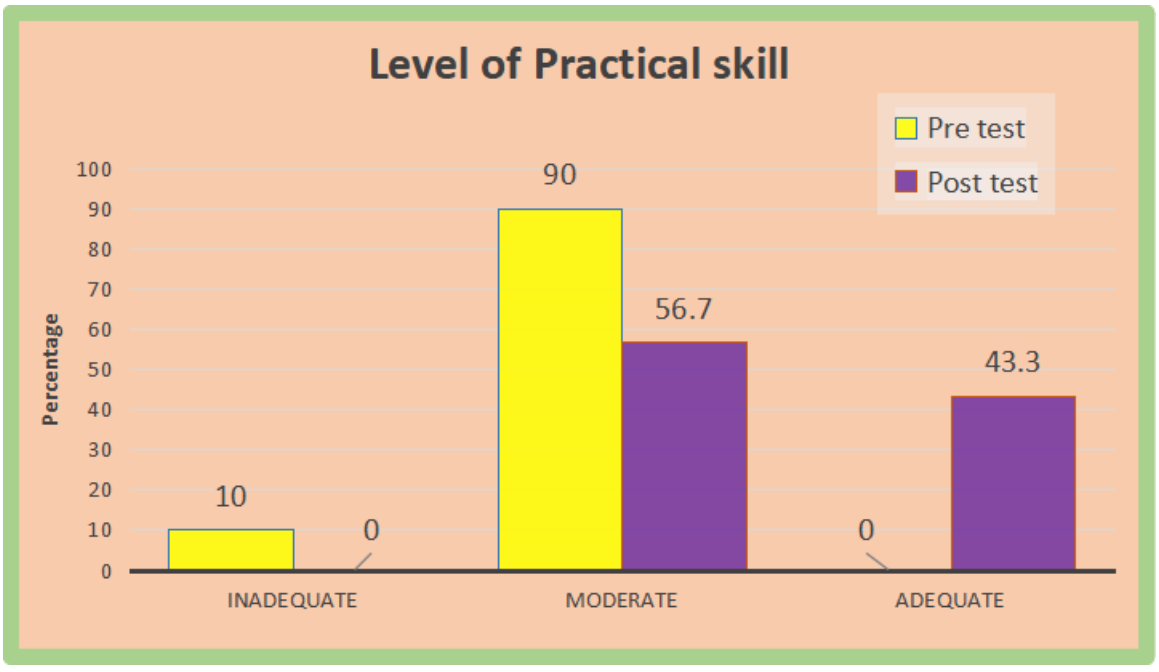

Table-4: Frequency and percentage wise to effect of simulation-based training on nursing students' behavioral competence in postpartum haemorrhage management.

Level of efficacy	efficacy score			
	Pre test		Post test	
	f	%	f	%
Inadequate	27	90	0	0
Moderate	3	10	11	36.7
Adequate	0	0	19	63.3
Overall	30	100	15	100

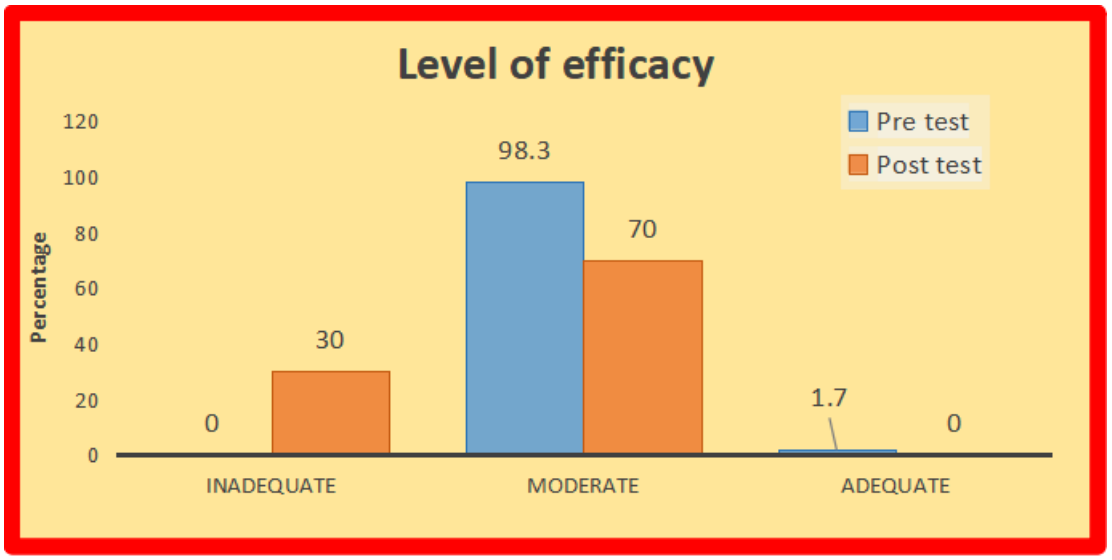

Table 5: Paired "t"-test was found to effect of simulation-based training on nursing students' behavioral competence in postpartum haemorrhage management.

Level of knowledge	Pre Test		Post Test		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Overall	12.47	3.51	17.63	3.28	5.17	6.14	p<0.001***(HS)

*-P<0.05, significant and **-P<0.01 &***-P<0.001, Highly significant (df=29, table value =2.02)

5. Conclusion

This chapter has covered data analysis and interpretation of research findings. The current research has been analysed using descriptive and inferential statistics, and the study's findings are provided in connection to the study's objectives and hypothesis.

After undergoing simulation-based training, there was a substantial shift in knowledge levels 68.8% of the students achieved an adequate level of knowledge, and the remaining 31.2% demonstrated a moderate level. Importantly, no students were categorized as having inadequate knowledge in the post-test.

Simulation-based training, nearly half of the students (48.8%) reached an adequate level of practical competence, and the remaining 51.2% exhibited moderate skills. Importantly, no student remained in the inadequate category post-training.

The **overall efficacy** score, combining both self and collective efficacy, also showed a substantial increase from 62.94 (SD = 5.85) to 125.78 (SD = 8.26), with a mean difference of 62.85 and a *t*-value of 97.36, which is highly statistically significant ($p < 0.001$). These results clearly demonstrate that simulation-based training significantly enhanced the behavioral competence and confidence of nursing students in managing postpartum haemorrhage. Therefore, accept research hypothesis H_1.

References:

[1] Abdelbaky, H. S. (2024). the effect of simulation based education on maternity nursing students' performance and self confidence regarding postpartum hemorrhage management. Helwan International Journal for Nursing Research and Practice, 3(7), 262-274.https://dx.doi.org/10.21608/hijnrp.2024.300266.1180

[2] Abdelgadir, N. I., Brier, S. L., Abdelgadir, W. I., & Mohammed, S. A. (2022). The effect of training program on midwives practice concerning timely management of postpartum Hemorrhage at Aljenena town Dafur. *Nat. Med. Sci*, *21*, 49-56.

[3] Abisogun, E. O. (2019). Impact of Simulation Education on Nurses' Confidence and Efficacy during Postpartum Hemorrhage. Grand Canyon University.

[4] Aktaş, S., Aydın, R., Osmanağaoğlu, M. A., Burma, E., Biryeşil, B., Ece, Ö., ... & Gündüz, A. (2021). The Effect of Simulation-Based Vaginal Birth and Obstetrical Emergency Training for Emergency Health Professionals: A Quasi Experimental Study. Journal of Basic and Clinical Health Sciences, 5(3), 137-148.

[5] Althabe, F., Therrien, M. N., Pingray, V., Hermida, J., Gulmezoglu, A. M., Armbruster, D., € & Miller, S. (2020). Postpartum hemorrhage care bundles to improve adherence to guidelines: A WHO technical consultation. International Journal of Gynecology & Obstetrics, 148(3), 290–299.