Effectiveness of simulation based learning regarding management of antepartum haemorrhage in terms of competency among nursing students a quasi-experimental study

Himani[1], Adiba Siddiqui[2]*, Manpreet Kaur[3] and Jyoti Sarin[4]

[1]M.Sc.Nursing Student, RN, RM, Dept. Obstetrics and Gynaecological Nursing, Maharishi Markandeshwar, College of Nursing, Mullana, Ambala, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India
Email: himaniattri36@gmail.com
Contact Number- 8544708172

[2]*Professor and HOD, RN, RM Dept. Obstetrics and Gynaecological Nursing, Maharishi Markandeshwar, College of Nursing, Mullana, Ambala, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India
Email: siddiquiadiba@gmail.com,
Contact Number- 7988971304

[3]Associate Professor, RN, RM Dept. Mental Health Nursing, Maharishi Markandeshwar, college of Nursing, Mullana, Ambala, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India
Email: kaurmanpreet@gmail.com
Contact Number- 9996842373

[4]Ph.D. (Nursing), RN, RM Director- Principal, Maharishi Markandeshwar, College of Nursing, Mullana, Ambala, Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, Haryana, India
Email: directormmcn@mmumullana.org
Contact Number- 9643281814
*Corresponding Author: Ms. Adiba Siddiqui
*Designation –Professor and HOD, Obstetrics and Gynaecological Nursing Department, M.M College of Nursing, Maharishi Markandeshwar (Deemed to be) University, Mullana, Ambala, Haryana, Contact Number- 7988971304
*Address correspondence to: Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, India, Pin code: 133207
Tel: 1800-2740-240, +918544708172
Fax:+91-1731-274495
Email: himaniattri36@gmail.com

Abstract

Introduction: Antepartum haemorrhage is a obstetrical emergency and is a leading cause of maternal and perinatal mortality and morbidity. APH defined as hemorrhage from the genital tract after 24 weeks of gestation but before the delivery of the baby.Purpose: The aim of the study was to assess the effectiveness of simulation based learning in terms of competency regarding Management of Antepartum Haemorrhage among Nursing Students.Methods: A quasi – experimental (non-equivalent control group Pre-test Post-test design) study conducted on 124 B.Sc Nursing 4th students selected by purposive sampling technique and divided in experimental (n=60) and comparison group (n=64) by random table method. Data was collected by Selected variables, Structured knowledge questionnaire, Objective structured clinical examination checklist and Clinical decision making ability questionnaire were used to collect data from B.Sc Nursing students through E-filling and OSCE checklist.. Data was analysed by descriptive and inferential statistics by using SPSS version 20.Results: The study results showed that the mean posttestknowledge score of comparison(13.18±5.53) and experimental group (12.83±4.98) were nearly equal and post test skills scores in experimental group (38.33±6.03) was higher than the (26.21±8.06) comparison group. The calculated Z value of post test skills scores in experimental and comparison group -7.51 was found to be statistically significant at 0.01 level of significance. The mean post test clinical decision making ability in experimental (10.13±5.79) and comparison group (10.50±5.38) were nearly equal and z value of experimental

group (-0.41) were found to be statistically non significant at 0.01 level of significance.Conclusion: It can be concluded that Simulation based learning was effective in enhancing the competency in terms of knowledge, skills and clinical decision making ability regarding management of antepartum haemorrhage among nursing students.

Keywords: Competency, Simulation based learning, Management of Antepartum Haemorrhage, Nursing students.

Introduction

Pregnancy is a kind of miracle by the God and a mother's joy begins when new life is stirring inside and a tiny heartbeat is heard for the very first time. Safe motherhood is an important requisite for national development. Ensuring safe and high quality care in maternal and child health services is one of the biggest challenges facing the health care delivery system today. (According to WHO).1

Antepartum haemorrhage is a major leading cause of maternal mortality and morbidity worldwide. In India, APH complicates about 2-5% of all the pregnancies, the prevalence of APH is reported to be 18.8%.2

Maternal outcomes of pregnancy can improve by interventions and adequate antenatal care, which include primary preventions, detection of increased risk and early detection of any stage of management of Antepartum haemo-rrhage.3Competency such as knowledge, skills and clinical decision making of nursing personnel play an important role in the management of Antepartum haemorrhage.4 various studies shows that the majority of nursing students face difficulties in the practical implementation of theoretical knowledge. This is achieved through real knowledge and understanding of the science of health care, in which the theory of nursing is integrated with practical skills. The teaching method that contributes to this is simulation.5

Simulation-based learning plays an important role in nursing education.6&7 Simulation based learning is a systematic method to acquire and maintain competence which makes bridge between knowledge and clinical practice. Simulation can be the way to develop nursing students knowledge, skills, critical thinking and decision making, as it enable students to work in an environment closely resembling that of a hospital and help them to gain healthcare and nursing experiences, even before they start working as professionals.8

Various studies had shown that simulation based learning method can be conducted for nursing programme regarding their content of the courses which includes Maternal Health (Laboring mother, Bathing, Post-partum care, New born assessment)Nursing student should be well trained to provide effective care for Management of patient with APH.9

With this background study was carried out to assess effectiveness of simulation based learning in terms of competency regarding Management of Antepartum Haemorrhage among nursing students.

Objectives

To assess and compare the competency in terms of knowledge, skills, clinical decision making ability regarding management of Antepartum Haemorrhage among nursing students in experimental and comparison group.

To determine relationship between knowledge, skills, clinical decision making ability regarding management of Antepartum Haemorrhage in experimental and comparison group.

Methods

Design

A quasi-experimental (Non-equivalent control group Pre-test Post-test design) study was conducted to assess effectiveness of simul-ation baed learning in terms of competency (knowledge, skills and clinical decision making ability) regarding management of antepartum Haemorrhage.

Sample & Setting

The study population consisted of 124 B.Sc. Nursing 4th year students studying in M.M College of Nursing, Mullana Ambala Haryana and M.M Institute of Nursing Mullana, Ambala, Haryana and clinical skill and simulation Centre, M.M (Deemed to be) University, Mullana Ambala were allocated by random table method in experimental group (n=60) and comparison group (n=64) by using purposive sampling technique.

Data collection

After ethical approval from the institutional ethical committee of MM (Deemed to be University), Mullana. The participants were explained about the research study and its purpose before data collection. Informed consent was obtained from the study participants and they were assured about the confidentiality of the response. On day 1 of data collection, the pre-test of 129 students were taken. On day 2, students were divided in experimental (64) and comparison group (65) by random table method. Before intervention, one simulation based video made by researcher on simulation based learning regarding management of Antepartum haemorrhage. Thereafter, intervention was given to experimental group (n=60) four students in experimental group were absent and no intervention was given to comparison group (n=65). On day 15, post-test of both experimental and comparison group was conducted. But at the time of post- test 60 students in experimental group and 64 student in comparison group one student were absent in post test. Therefore, the analysis was done on the 124 nursing students (60 nursing students in

experimental group and 64 in comparison group).

Simulation scenario

Simulation based learning was given to experimental group through two case scenarios. 1st simulation scenario was regarding management placenta previa and 2nd scenario regarding the management of patient with abruption placenta. The intervention was given for two days (45 minutes for each scenario). Participants were divided in 5 groups and in each group, there were 12 nursing students.

Tools

The tools developed and used for the data collection were selected variables (4 items), structured knowledge questionnaire (30 items), objective structured clinical examination checklist (52 items) and structured clinical decision making ability questionnaire (25 items). The tools were validated from nine experts from the field of nursing department, medical department. The content validity of the tools was assessed and found that selected variable (SCVI- 0.95; ICVI- 0.85-1), structured knowledge questionnaire (SCVI- 0.98; ICVI- 0.85-1), OSCE checklist (SCVI- 0.11; ICVI- 0.85-1) and structured clinical decision making ability Questionnaire (SCVI- 0.18; ICVI- 0.11-1) and tools were found to be reliable.

Selected variable

Gender, have you ever nursed a patient with Management of Antepartum Haemorrhage, previous sessional score (Obstetrical and Gynaecological Nursing), clinical evaluation marks (Obstetrical and Gynaecological Nursing).

Structured knowledge questionnaire

A structured knowledge questionnaire consisted of 30 multiple choice questions. The maximum possible score 30 and minimum score was zero on the structured knowledge questionnaire.

Objective structured clinical examination checklist

There were total 7 OSCE stations in which one station was unmend (consisted of four items) and three mend stations in which OSCE checklist were prepared. Each item has marking of 0 (Not attempted and not done correctly) and 1 (done correctly) based on the response of the nursing students.

Structured clinical decision making ability questionnaire

Structured clinical decision making ability questionnaire comprises in five case scenarios The maximum possible score was 25 and minimum score was zero.

Ethical Clearance

Formal administration approval for conducting the study were obtained from the Institutional Ethical Committee of Maharishi Markandeshwar (Deemed to be University), Mullana Ambala Haryana. (Project No. IEC- 2143) to conduct the final study. Permission was obtained from concerned authority for conducting pilot study and final study. The participants were explained about the research study and its purpose before data collection. Informed consent was obtained from the study participants and they were assured about the confidentiality of the response.

Data Analysis

Data analysis was done by using both descriptive and inferential statistics i.e. frequency, mean, median, standard deviation, chi-square, Mann Whitney U test, Wilcoxon test and spearman correlation test. SPSS (Armnok, NY, USA: IBM Corp) version 20.00 software was used for data analysis. Kolmogorov- Smirnov test (KS) test was used to check the normality of data distribution and it was found that pre-test score (p=0.00), (p=0.00) were statistically significant at 0.01 level of significance. Hence the non-parametric test was applied to assess the knowledge, skills and clinical decision making ability among nursing students in experimental and comparison group.
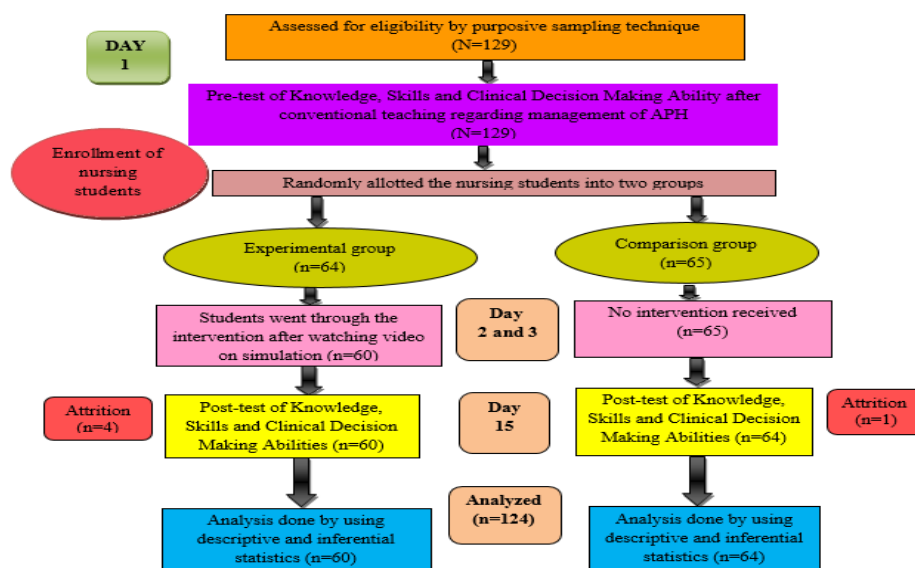
Consort Diagram

Figure 1: Consort Diagram showing Sample Selection

Results

The results of the study were starting with the demographic distribution of participants as shown in (Table – 1)

The computed chi-square value was found to be statistically nonsignificant regarding gender, Nursed patient with APH, Sessional marks in OBG and Clinical evaluation marks in OBG

Table 1: Frequency, Percentage Distribution and Chi Square Showing Comparison of Experimental and Comparison Group in terms of Selected Variables of Nursing StudentsN=124

Seclected Variables	Experimental group n=60f (%)	Comparison group n= 64f (%)	χ2	df	p value
1. GENDER					
1.1 Male	16 (26.7%)	15 (23.44%)	0.17	1	0.67NS
1.2 Female	44 (73.3%)	49 (76.56%)			
2. Have you ever nursed a patient with APH?					
2.1 Yes	7 (11.67%)	2 (3.12%)	3.35	1	0.06NS
2.2 No	53 (88.33%)	62 (96.88%)			
3.Previous cumulative sessional scores in OBG					
3.1. 0-22	8 (13.3%)	4 (6.25%)	5.25	2	0.07NS
3.2. 23-44	22 (36.7%)	36 (56.25%)			
3.3. 45-65	30 (50%)	24 (37.5%)			
4.Clinical evaluation marks in OBG		-			
4.1. 0-30	1 (1.67%)	1(1.56%)	3.45	2	0.17NS
4.2. 31-60	1 (1.67%)	6 (9.38%)			
5.3. 61-88	58 (96.66%)	57 (89.06%)			

NS Not significant (p>0.01χ2 (1) = 6.63
*Significant (p>0.01) χ2 (2) = 9.21

Table 1 shows that Chi-square values for the selected variables of the nursing students between both experi-mental and comparison group for gender (0.67), nursed patient with management of antepartum haemorrhage (0.06), sessional marks (0.07), clinical evaluation marks (0.17) were found to be non-significant at 0.01 level of significance.
hence, it concluded that nursing students in both experimental group and comparison group were homogenous and comparable in terms of their selected variables at baseline.

TABLE 2: Mann-Whitney U-test showing difference in pretest and post-test Knowledge Score regarding Management of Antepartum Haemorrhage among Nursing Students in Experimental and Comparison GroupN=124

Group	Experimental Group	Comparison Group	Z§ (between)	p
Before intervention	8.91+5.86	9.07+6.03	-4.00	0.79NS
After intervention	12.83+4.98	13.18+5.53	-3.89	0.75 NS
Z †with in	-4.00	-3.89		
P	0.00*	0.00*		

NS Not significant (p>0.01)
Z= -2.57 to 2.57 *Significant (p<0.01)

The results of Mann-Whitney U-test showed a statistically significant difference in pre- and post-test knowledge score among nursing students on Management of Antepartum Haemorrhage

TABLE 3: Mann-Whitney U-test showing difference in pretest and post-test skills Score regarding Management of Antepartum Haemorrhage among NursingStudents in Experimental and Comparison GroupN =124

Group	Experimental Group	Comparison Group	Z§ (between)	p
Before intervention	19.50+5.28	17.70+7.01	-1.17	0.24 NS
After intervention	38.33+6.03	26.21+8.06	-7.51	0.00*
Z †(with in)	-6.73	-5.97		
P	0.00*	0.00*		

NS Not significant (p>0.01)
Z= -2.57 to 2.57 *Significant (p<0.01)

The results of Mann-Whitney U-test showed a statistically significant difference in pre- and post-test skills score among nursing students on Management of Antepartum Haemorrhage

TABLE 4: Mann-Whitney U-test showing difference in pretest and post-test clinical decision making ability Score regarding Management of Antepartum Haemorrhage among Nursing Students in Experimental and Comparison GroupN=124

Group	Experimental Group	Comparison Group	Z§ (between)	p
Before intervention	6.31±4.83	7.35±5.11	-1.23	0.21 NS
After intervention	10.13±5.79	10.50±5.38	-0.41	0.67 NS
Z †with in	-4.20	-4.19		
p	0.00*	0.00*		

NS Not significant (p>0.01)
Z= -2.57 to 2.57 *Significant (p<0.01)

The results of Mann-Whitney U-test showed a statistically significant difference in pre- and post- test score of clinical decision making ability among nursing students on Management of Antepartum Haemorrhage

Table 5: Spearman Correlation showing between the Pre-test and Post-test Knowledge, Skills and Clinical Decision Making Ability Score regarding Management of Antepartum Haemorrhage of Nursing Students in Experimental and Comparison Group N=124

Groups				Skills		Clinical decision making ability	
				Pre-test	Post-test	Pre-test	Post-test
Experimentalgroup(60)	Know-ledge	Pre-test		0.19 (0.14)ns		0.53(0.00)*	
		Post-test			0.12(0.35)ns		0.52(0.00)*
Comparison group(64)	Know-ledge	Pre-test	0.19 (0.12) ns			0.69(0.00)*	
		Post-test			0.27(0.02)*		0.34(0.00)*

NS Not significant (p>0.05) r at 124 = 0.19
*Significant (p<0.05)

Figure 5 showed that there was statistically mild positive significant correlation between pre-test knowledge and skills (r=0.19, p=0.14) and mild positive significant correlation between post-test knowledge and skills (r=0.12, p=0.35) in experimental group. There was highly positive significant correlation between pretest knowledge and clinical decision making ability (r=0.53, p=0.00) and highly positive significant corelation between posttest knowledge and clinical decision making ability (r=0.52, p=0.00) in experimental group. That means clinical decision making ability of the nursing students was increased with increased in knowledge regarding management of Antepartum haemorrhage.

Discussion

In the present study, maximum students had good knowledge regarding management of antepartum haemorrhage in experimental group that is significant at 0.01 level of significance.

These findings were consistent with the study conducted author Jayanthi (2018).The study result showed that, 70% of the respondents had inadequate knowledge 30% moderate knowledge regarding causes and intervention of APH in the pre test. After administration of structured teaching program, 20% of respondents had moderate knowledge and 80% the respondents had adequate knowledge regarding causes and intervention of APH in the post test.

Findings related to knowledge of simulation based learning regarding Management of Antepartum Haemorrhage in Experimental group and Comparison group of the study

In the present study, the mean pre and posttest knowledge score of nursing students i.e. 12.83+4.98 was significantly higher than the mean pretest knowledge score (8.91+5.86) regarding management of antepartum haemorrhage in experimental group that is significant at 0.01 level of significance.

These findings were consistent with the study by Afaf Mohamed Mohamed Emam et.al (2018) which indicated that there were statistically significant differences (P<.001) in pre and post knowledge and practices mean scores of the nurses after intervention in which distribution of the written booklet to nurses used as an ongoing reference, was helpful in nurses' acquisition of knowledge. Regarding mean practices scores of the staff nurse, the findings of present study revealed that there were highly statistically significant differences (P<.001) between pre and post intervention in relation to nurses practices about, initial assessment and emergency measures, patient/ caregiver teaching (instructions and explanations). Preparation for investigations and operations, nurses administration of physical care and medication and infection control and prevention and total practices score.

In the present study, maximum students had good knowledge regarding management of antepartum haemorrhage in experimental group that is significant at 0.01 level of significance

Recommendations

A mixed method study may be conducted to identify barriers to the development of Clinical Simulation or difficulties that may be encountered.

Comparative study can be to assess effectiveness of simulation based learning and other traditional methods of teaching in terms of competency regarding management of antepartum haemorrhage.

The nursing personnel must encourage about the importance of attending the continuing education sessions in the form of workshop, conferences,training program and reviewing update nursing care regarding management of antepartum haemorrhage.

A similar study can be conducted on other areas of management of antepartum haemorrhage i.e vasa previa.

Conclusions

Based on the findings of the study it can be concluded that simulation based learning was effective in enhancing the competency in terms of knowledge, skills, clinical decision making ability regarding antepartum haemorrhage among nursing students.

Conflicts of intrust

The authors declare no conflicts of interest

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