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The Effect of Simulation Based Education on Maternity Nursing Students' Performance and Self -Confidence Regarding Post-Partum Hemorrhage Management

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Abstract

Background: postpartum period is critical, with potential complications such as postpartum hemorrhage that can be fatal if not promptly managed. Simulation in nursing education enables students to practice emergency responses in a safe and controlled environment**. Aim:** The aim of the current study was to evaluate the effect of simulation-based education on maternity Nursing students' performance and self-confidence regarding postpartum hemorrhage management**. Design:** A quasi-experimental research design. **Setting:** The study would carried out in lab of Maternity Skills and classroom at Faculty of Nursing October 6 University. **Sample:** A convenient sample of 80 students (40 study group-40 control group). **Tools:** three tools were used; **Tool(I):** structured interviewing questionnaire regarding socio-demographic data and assessment of maternity nursing students' knowledge regarding postpartum hemorrhage management , **Tool (II):** observational practice checklist**, Tool (III):** Modified Self-confidence measurement Scale, **Result:** the finding reveals that; there was a highly significant statistical positive correlation between studied students' total knowledge score, total practices score and total self-confidence score regarding postpartum hemorrhage management at post intervention phase.. **Conclusion:** The findings Based on the results of simulation based education supported the research hypothesis and achieved the current study that the maternity nursing students'who attended the simulation based educational program achieved higher score of knowledge , practice and attitude as compare to their mean pre test scores . **Recommendations** It is advised that high-fidelity simulation be incorporated into the maternity nursing education curriculum, with a specific focus on postpartum hemorrhage management.

Key words: Simulation, Post-partum Hemorrhage (PPH), Self Confidence

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Introduction

The postpartum period, often known as the fourth trimester, is a crucial phase in maternal and neonatal health, encompassing the first six weeks following childbirth. This period is vital as it involves significant physical, emotional, and psychological adjustments for the mother. Physiologically, the mother's body undergoes substantial changes, including hormonal shifts and recovery from childbirth, which necessitate close monitoring to prevent complications. One of the most critical complications during this time is postpartum hemorrhage, a leading cause of maternal mortality globally. **(Corvino et al., 2021).**

Postpartum hemorrhage (PPH) is a serious condition that can have various complications if not managed promptly and effectively. Hypovolemic shock: Severe bleeding in PPH can lead to a significant loss of blood and subsequent hypovolemic shock. This condition occurs when there is insufficient blood volume to adequately perfuse the organs, resulting in symptoms such as low blood pressure, rapid heartbeat, and altered mental status. Hypovolemic shock requires immediate medical Intervention to restore blood volume and prevent further complications **(McLintock, 2020).**

Simulation refers to the imitation or replication of a real-world process, system or event using a computer-based model or software. It involves creating a virtual environment or scenario that behaves similar to the real system allowing users to interact with and observe the simulated system's dynamics and outcomes. Simulation can be used for various purposes, including training, education, research, and decision-making **(Lateef et al., 2021).**

Conventional nursing education methods, while essential, often lack the immersive and practical experiences necessary for mastering complex clinical situations. In this context, simulation-based education (SBE) has emerged as a powerful tool. SBE allows students to engage in realistic, controlled clinical scenarios without risk, helping to refine their technical skills and build their confidence for real-world applications. (**Koukourikos et al., 2021)**

Nurses play a pivotal role in addressing PPH, encompassing timely identification, swift intervention, and ongoing assistance. Early detection entails vigilant monitoring of the mother's vital signs, uterine condition, and post-birth discharge to detect any irregular bleeding. Nurses collaborate with other healthcare professionals such as obstetricians, midwives and social workers to facilitate further interventions. Recent guidelines underscore the significance of standardized protocols and interdisciplinary teamwork in managing PPH, highlighting the indispensable role of well-trained nursing personnel in mitigating the occurrence and complications associated with this condition**. (Pandin, 2021).**

Significance of the study:

Simulation training is a valuable method to improve maternity Nurses' knowledge, practice and self-confidence to save the women health outcome that are deteriorating from postpartum hemorrhage. Failure of the uterus to contract adequately after childbirth is the most common cause of postpartum hemorrhage. In the absence of timely and appropriate action, a woman could die within a few hours. In developing countries, mortality from PPH remains high and recent studies

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have shown that PPH causes up to 60 per cent of all maternal deaths. PPH also causes considerable suffering for women and their families and places a heavy burden on national health systems. Although most pregnancies and births are uneventful, approximately 15% of all pregnant women develop a potentially life-threatening complication that calls for skilled care and some will require a major obstetrical intervention to survive **(Haimee et al.2016)**

The current study that Simulation-based education allows reality to be brought. Learners can take over certain roles and act in a hands-on (and heads-on) way in a simulated professional context so that it gives the chance to the students to deal with post-partum hemorrhage management efficiently.

Aim of the Study

This study aimed to:

The aim of current study was to evaluate the effect of simulation-based education on maternity Nursing students' performance and self-confidence regarding postpartum hemorrhage management**.**

Research Hypothesis:

The current study hypothesized that:

- The mean posttest knowledge scores of Maternity Nursing students' who will attend the simulation-based educational program will be higher as compared to their mean pre-test scores.
- The mean posttest practice scores of Maternity Nursing students' who will attend the simulation-based educational program will be higher as compared to their mean pretest score.
- Nursing students who will attend the simulation-based educational program will have significantly higher self-confidence as related to post-partum hemorrhage management

Research design:

A Quasi-experimental research design was utilized to conduct this study. Quasi-experimental design aims to establish cause and effect relationship between independent and dependent variables. However, a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria **(Janssen & Kollar, 2021).**

Setting*:*

The study would be carried out in lab of Maternity Skills at Faculty of Nursing October 6 University in October city. The laboratory is located on 2nd floor, with the floor consisting of a waiting area and two labs, one dedicated to critical care nursing and the other to maternity nursing. The maternity nursing lab contains (4 Beds, two basins for washing hands, Projector, A cupboard contains a tray for performing nursing procedures, Whiteboard, Furniture for all uses, Frist aid box for minor accidental injuries and contains some models of female pelvis and uterus. -It contains all the supplies required for all nursing procedures in the Maternity and Newborn Health Nursing Department and in class room located in fourth floor.

Sample

A convenient sample for 80 students (40 study group-40 control group) that all registered in maternal and newborn health nursing course in the fifth academic semester 2023-2024 for 3 months during the period of data collection from lab of Maternity Skills at Faculty of Nursing October 6 University.

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Tools for data collection:

three tools were used to collect data of this study as follow:

Tool (I): A structured interviewing questionnaire:

That tool designed by researcher, and it was written in simple English language: **It comprised of two parts:**

Part I: Socio-demographic data:

This part was used to assess Socio-demographic characteristic of the studied students such as: (Gender, Identification code, Level of education, Grade point average score, and previous simulation training program participation).

Part II: Assessment of maternity nursing students' knowledge regarding postpartum hemorrhage management:

this sheet designed by researchers after extensive review of literature **Fissahaye et al.,(2023)** including: definition (primary and secondary), causes, risk factors, types, classification, assessment of PPH, complications, signs of PPH, stages of PPH active management of third stage of labor and management of PPH (1٧ Questions).

Scoring system:

The maternity nurses students' knowledge was scored as follow: 2 = complete correct answer. 1 = incomplete correct answer. 0 = incorrect answer. Total score of Satisfactory ≥ 75%, Unsatisfactory <75%

Tool (II): Observational practice checklist:

That tool it was designed by researcher

Performance skills were measured by checklist **(Arshad et al., 2024)** .the practice checklist contains the individual steps or tasks in the sequence required to perform all the skills or activities being taught in a standardized way and include: 1-managment of postpartum hemorrhage

2-uterine and lochia assessment procedure

Scoring system:

The maternity nurses' practice was scored as follow: 2 = done the step or task completely. 1 = done the step or task incompletely. 0 = Not done. Total score of Adequate ≥ 75%, Inadequate <75%

Tool (III): Modified Self-confidence measurement Scale:

That tool Adapted from **(Abd Elhakm, & Elbana, (2018)** and modified by the researcher consist of 7-items (Confident about mastering the content of the training activity , Confident that the training covered critical content , Confident about developing skills & obtaining the required knowledge , Instructors used helpful resources to teach the method, It is my responsibility as the student to learn what I need to know from this method of training , Know how to get help when I do not understand the concepts covered in the method of teaching , Know how to use activities to learn critical aspects of these skills) that measures how confident student nurses feel about the skills they practice when participating in the patient simulation experience

Scoring system:

Items are measured on a three-point Likert scale (strongly disagree (0), disagree (1), agree (2). Total score of Confident ≥ 75%, Inconfident <75%.

Validity:

Content validity was conducted to determine whether the content of the tools cover the aim of study, it was measured by jury of 3 experts,

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one professor of maternity and new-born health nursing at Faculty of Nursing , October 6 University and one assistant professor of maternity and new-born health nursing at Faculty of Nursing, Helwan University and one Lecturer of maternity and new-born health nursing at Faculty of Nursing, Helwan University The expertise reviewed the tool for clarity ofsentences,relevance, accuracy, comprehensiveness, simplicity and applicability and minor modification were done such as (clarity of sentences of the tool). Finally, the final forms were developed.

Reliability:

Reliability of tools was applied by investigator for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar condition on one or more occasion. Cronbach's alpha was 0.84 for Intern consistency of student's knowledge regarding postpartum hemorrhage, 0.89 for Observational practice checklist,0.91 for Modified Self-confidence measurement Scale.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the scientific research ethics committee at Faculty of Nursing Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information, where they weren't be accessed by any other party. Ethics, values, culture and beliefs were respected.

Pilot study:

A pilot study was conducted to test feasibility and applicability of the study tools. It was carried out on 10% of total study subjects (8). There were no modifications of tools and the student's included in the pilot study were included in the main study sample.

Fieldwork:

- Data collection was started and completed within three months, from beginning of October 2023 to December 2023. After obtaining all official permissions.
- The Researcher visited the study setting two days weekly from 9 am- 4pm and met the students, introduced herself, the aim of the study was explained and gave them a complete background about the study and sheet format which used to collect the required data.
- All ethical considerations were respected. The gathered date helped the researcher to assess their general condition and provide appropriate intervention accordingly.

Firstly, regarding students the data collection was carried out 4 steps as the following:(Preparatory-assessment-implementation-evaluation phase)

Preparatory Phase: (Study group).

- Introduction to Simulation-Based Education: The nursing students were introduced to the concept and benefits of simulation-based education. They were informed that this method would help improve their performance and self-confidence in managing postpartum hemorrhage (PPH).
- Explanation of Simulation Tools and Scenarios**:** Each student received a detailed explanation of

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the simulation tools, including high-fidelity mannequins, computer-based simulations, and role-playing scenarios. The objectives and procedures of the simulation sessions were thoroughly explained.

- Addressing Concerns and Encouraging Participation**:** Some students initially expressed concerns about the simulation-based education method. The researchers addressed these concerns by explaining the safety, effectiveness, and advantages of simulation in a controlled environment. Students were reassured that the simulation would enhance their practical skills and theoretical knowledge without any risk.

Assessment (Control and study group).

- Structured interview questionnaire was done to assess the student's Socio-demographic characteristics. The researcher gathered control and study group in a
- classroom and take questionnaire about 10 minutes.
- Then the researcher assessed students' knowledge regarding postpartum hemorrhage management and this assessment take about 30 minutes.
- During the initial week, the intervention was carried out across a span of two days. In the first session, the control group, consisting of 40 students, commenced from 10:00 AM to 12:00 PM. A pretest was administered to gauge their understanding, followed by student-led presentations on postpartum hemorrhage, which the researcher supervised. Following the presentations, a posttest was conducted. On the subsequent day, the study group, also comprising 40 students, followed a similar timetable. They underwent a pretest, viewed a simulation-based video on postpartum hemorrhage and its management, and then completed a posttest.

Implementation phase (control group).

- Firstly, the study samples were taken in odd weeks from period of study.

In the second and fourth weeks, the study began with the control group. Over two days each week, 10 students were trained daily from 9 AM to 12 PM. Each session started with a 30-minute explanation of the procedure, followed by a 4-minute individual for each student practice of the procedure in the lab using the standard method. On the second day, another 10 students were trained. This process continued over the two weeks until the entire control group of 40 students was trained. After completing each group, the modified self-confidence measurement scale was administered to the students.

study group: The program was implemented over several weeks with experimental groups participating in sessions during the third, fifth, and sixth weeks. Each session consisted of dividing the group into teams of 10 students over two days, starting at 9 a.m. and ending at 12 p.m. The initial 30 minutes involved a briefing on simulation and postpartum hemorrhage management, followed by a 10-minute video presentation on the simulation scenario. Subsequently, each student was assigned a scenario, and their performance was assessed during a 4-minute simulation procedure. This process was repeated in subsequent weeks until a total of 40 students were included in the experimental group. After each session, a 20-minute debriefing session was conducted to gather oral feedback on positive and negative aspects from the students. Finally, a modified self-confidence measurement scale was

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administered to evaluate the students' confidence levels.

Evaluation:

- Evaluate the students' ability to apply the knowledge and skills learned during the simulation sessions in real-world scenarios. from study and control group immediately after give content with different method of teaching that students by the same knowledge tool.
- Finally, had assessed student's self-confidence regarding postpartum hemorrhage management in the method of simulation-based education from (study group) and from (control group) through tool of Modified Self-confidence measurement Scale.

Statistical item:

Prior to automated input, data were checked. Data tabulation and analysis were done using SPSS version 25.0 (Statistical Package for Social Sciences). The use of descriptive statistics was used (e.g., mean, standard deviations, frequencies, and percentages). Pearson correlation coefficients, and Chi-square tests were applied. Degrees of significance of results were considered as follow: P value > 0.05 was considered non-significant (NS), P value ≤ 0.05 was considered significant (S) **(Niati, 2021).**

Results:

Table (1) shows that, there was no significant difference between demographic data of the study and control groups. As for age, there was 55.0% aged 20 years in the study group versus 65.0% in the control group with a mean age of 20.67±0.88 years and 20.55±0.90 years respectively. In the study group 70% were males versus 60% in the control group while 95% of both groups was in third educational level and the GPA of 37.5% of both groups was 2.5-3. Also 70% in the study group versus 50% in the control group had previous training.

Figure (1). Shows that 37.5% and 30.0% of students in both study and control groups respectively had satisfactory knowledge regarding postpartum hemorrhage management at pre intervention phase. Meanwhile, 82.5% and 55.0% of students in both study and control groups respectively had satisfactory knowledge regarding postpartum hemorrhage management at post intervention phase.

Table (3) shows that, 87.5% and 60.0% of students in both study and control groups respectively had adequate practices regarding uterine and lochia assessment. As well as, 77.5% and 55.0% of students in both study and control groups respectively had adequate practices regarding postpartum hemorrhage management with a statistical significant difference between studied students in both study and control groups in favor of study group with (P≤0.05).

Table (4): Reveals that there was a significant difference between the self-confidence of the study group and control group in all items of self-confidence (P ≤ 0.05). As regards, 90.0% of the study group agreed that it is his responsibility as the student to learn what he need to know from this method of training and know how to use activities to learn critical aspects of these skills versus 60.0% and 57.0% of control group respectively.

Table (5) shows that, there was a highly significant statistical positive correlation between studied students' total knowledge score, total practices score and total self-confidence score regarding postpartum hemorrhage management at post intervention phase with (P ≤ 0.001).

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Table (1): Distribution of nursing students regarding their general characteristics (n=80).

Demographic data	Study (n=40)		Control (n=40)		X2	p value
	No.	%	No.	%		
Age						
20-	22	55.0	26	65.0	2.01 ns	0.56
21-	11	27.5	9	22.5		
22-	5	12.5	2	5.0		
23	2	5.0	3	7.5		
Mean ±SD	20.67±0.88		20.55±0.90		t=0.62 ns	0.53
Gender						
Female	12	30.0	16	40.0	0.87 ns	0.34
Male	28	70.0	24	60.0		
Educational level						
Third	38	95.0	38	95.0	0.00 ns	1.00
Forth	2	5.0	2	5.0		
GPA						
Between 2 to 2.4	10	25	6	15	2.27 ns	0.51
From 2.5 to 3	15	37.5	15	37.5		
More than 3	15	37.5	18	45		
less than 2	0	0	1	2.5		
Previous training						
Yes	28	70	20	50	3.33 ns	0.06
No	12	30	20	50		

Chi-square test (x^2); P-value>0.05 (NS); t= independent t test

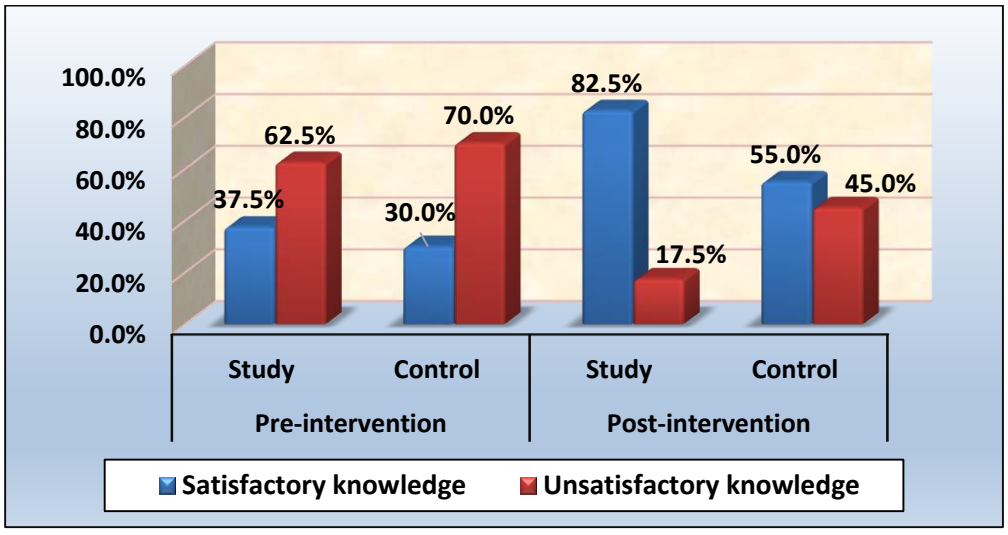

Figure (1): Distribution of studied students' total knowledge regarding postpartum hemorrhage management in both groups at pre and post-intervention phase (n=80).

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Table (2): Distribution of the studied students according to their total practices regarding uterine and lochia assessment and postpartum hemorrhage management (n=80).

Practices domains	Study n=40		Control n=40		X2 p-value
	No	%	No	%	
Practices regarding uterine and lochia assessment					
Adequate practices	35	87.5	24	60.0	7.81
Inadequate practices	5	12.5	16	40.0	0.005*
Practices regarding postpartum hemorrhage management					
Adequate practices	31	77.5	22	55.0	4.52
Inadequate practices	9	22.5	18	45.0	0.03*

***Significant at p-value ≤ 0.05**

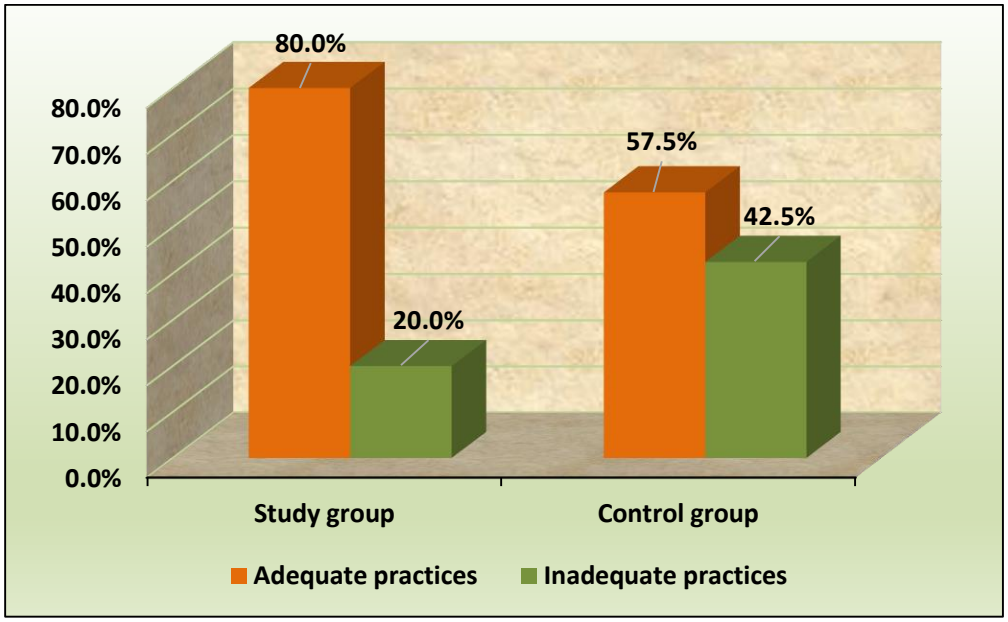

Figure (2): Distribution of studied students' total practices regarding postpartum hemorrhage management in both groups at pre and post-intervention phase (n=80).

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Table(3): Distribution of studied students at both groups regarding their self-confidence towards postpartum hemorrhage management (n=80).

Self-confidence Items	Study groups (n=40)						Control groups (n=40)						X2	p value
	Agree		Disagree		Strongly Disagree		Agree		Disagree		Strongly Disagree			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Confident about mastering the content of the training activity	35	87.5	5	12.5	0	0.0	22	55.0	13	32.5	5	12.5	11.5	0.003*
Confident that the training covered critical content	33	82.5	7	17.5	0	0.0	20	50.0	17	42.5	3	7.5	10.3	0.006*
Confident about developing skills & obtaining the required knowledge	33	82.5	7	17.5	0	0.0	22	55.0	14	35.0	4	10.0	7.58	0.01*
Instructors used helpful resources to teach the method.	34	85.0	6	15.0	0	0.0	20	50.0	16	40.0	4	10.0	12.1	0.002*
It is my responsibility as the student to learn what I need to know from this method of training	36	90.0	4	10.0	0	0.0	24	60.0	10	25.0	6	15.0	10.9	0.004*
Know how to get help when I do not understand the concepts covered in the method of teaching.	34	85.0	6	15.0	0	0.0	21	52.5	15	37.5	4	10.0	10.9	0.004*
Know how to use activities to learn critical aspects of these skills.	36	90.0	4	10.0	0	0.0	23	57.5	12	30.0	5	12.5	11.8	0.003*

***Significant at p-value ≤ 0.05**

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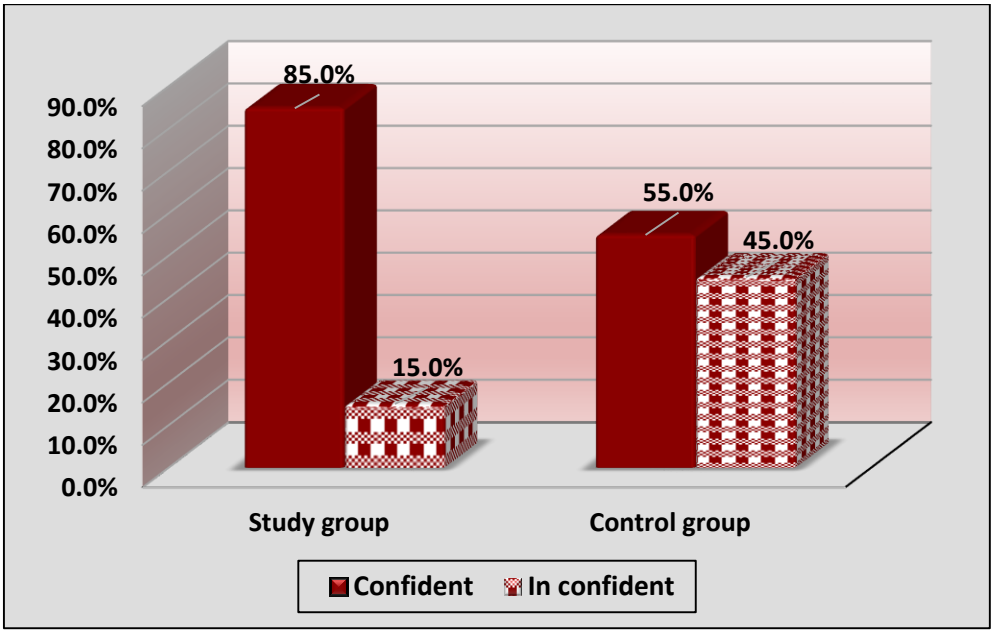

Figure (3): Distribution of studied students' total self-confidence regarding postpartum hemorrhage management in both groups (n=80).

Table (4): Correlation between studied students ' total knowledge score, total practices score and total self-confidence score regarding postpartum hemorrhage management at post intervention phase (n=80).

Variables	Total knowledge		Total practices	
	R	P-value	R	P-value
Total practices	0.438	0.000**		
Total self-confidence	0.450	0.000**	0.510	0.000**

****A Highly Statistical significant p ≤ 0.001**

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Discussion

Postpartum haemorrhage (PPH) is a significant concern in obstetrics, with a high incidence and potential for life-threatening **Post & Kiefer, (2023).** Postpartum haemorrhage continues to be the life threating obstetrical emergency, it is the leading cause of maternal death worldwide, in developed regions of the world it accounts for approximately 8% of maternal death while in developing regions of the world it accounts for approximately 20% of maternal death, can be primary when it occurs within 24 hours after child birth octonary when it occurs beyond 24 hours after delivery up to 12 weeks **(Kubuka et al., 2023).**

Regarding to socio demographical data of the studied students, the current study showed that there was no significant difference between demographic data of the study and control groups. As for age, there was more than half aged 20 years in the study group versus about two third in the control group with a mean age of 20.67±0.88 years and 20.55±0.90 years respectively. In the study group more than two third were males versus about two third in the control group while the most of both groups was in third educational level and the GPA of more than one third of both groups was 2.5-3. Also, more than two third in the study group versus half in the control group had previous training. These results were in the same line with **Kang & Kim, (2022)** who conducted a study in Korea, about "The Impact of Perinatal Loss Nursing Simulation among Undergraduate Students" and stated that the mean age of study participants was 21.62 (±1.19) years and more than two third students had experience in simulation education before Conversely, this finding was inconsistent with **Ehmke et al. (2022)** who revealed a study in United States of America about"Developing nursing students' self-efficacy during simulated obstetric emergencies" that there was more than half aged between 18–21 years, and the majority were females. Also, this result was contraindicated with **Mohamed et al., (2021)** who reported a study in minia about "The Relationship between Self-Confidence in Learning and Clinical Educators' Characteristics by Nursing Students" that the majority of the students were female, and more than two thirds aged 21 year. From the researcher point of view, Societal attitudes towards gender roles have evolved, making it more socially acceptable for men to enter professions traditionally dominated by women, such as nursing. Nursing is known for its job security, competitive salaries, and robust growth prospects, driven by an aging population, and increasing healthcare needs. These factors make nursing an attractive profession for individuals regardless of gender.

Regarding to students' total knowledge regarding postpartum haemorrhage management in both groups at pre- and post-intervention phase, the present study Shows that more than one third and about one third of students in both study and control groups respectively had satisfactory knowledge regarding postpartum haemorrhage management at pre intervention phase. Meanwhile, the majority and more than half of students in both study and control groups respectively had satisfactory knowledge regarding postpartum haemorrhage management at post intervention phase .This result was strongly agreed with **Hussein et al., (2023)** who carried out a study in the clinical obstetrics skill lab and the classroom of

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faculty of Nursing at Benha University, about "Effect of Simulation Training on Intern Nurses' Competence and Self-Confidence regarding Primary Postpartum Haemorrhage" and illustrated that more than one third of intern nurses had high level of satisfaction before simulation training. While the most of intern nurses had high level of satisfaction after simulation training. Also, this result is supported by **Metwally et al., (2021)** who conducted a study in in maternity hospital at Zagazig university hospitals, Sharkia Governorate, Egypt about" Developing Competences for Maternity Nurses during Labor regarding Prevention of Primary Postpartum Haemorrhage" and clarified that majority of studied maternity nurses had unsatisfactory knowledge about primary postpartum hemorrhage pre competency nursing intervention .Moreover, this finding was in the same line with **Angelina et al., (2019)** who reported in study in Tanzania about "Factors influencing nurses' knowledge and skills in the prevention and management of postpartum hemorrhage" that more than one third of the nurses had had satisfactory knowledge regarding postpartum hemorrhage management .the similarity between the previous study and the finding of the present study may stem from the fact that; before exposure to actual clinical areas, the process of simulating a scenario to practice various responses and actions in a safe and real-life situation is extremely effective. Thus, the high-fidelity simulation helps to improve students' learning and increase the retention of their knowledge through active simulation learning.this result was disagreed with **Sallam et al., (2024)** who revealed a study in labor and postpartum units at Suez Canal University Hospitals, Ismailia, Egypt, about "Nurses' Performance Regarding the Guidelines for Prevention of Postpartum Hemorrhage" that the level of knowledge of the studied nurses regarding prevention of postpartum hemorrhage, as more than half of them had an average knowledge, while about two-fifths of them had a poor level of knowledge about prevention of postpartum hemorrhage. from the researcher point of view, this satisfactory level of knowledge acquired by intern nurses may be due to the positive effect of simulation training with theoretical learning sessions. Distribution of Arabic booklet play a crucial role in attaining and retaining knowledge.

Regarding to total practices regarding postpartum haemorrhage management in both groups at pre- and post-intervention phase, the present study shows that the majority of students in study group and more than half of students in control group had adequate practices regarding postpartum haemorrhage management compared to less than one quarter and more than one third of them respectively had inadequate practices regarding postpartum haemorrhage management. This result was in the same line with **Alaswad et al., (2024)** who carried out a study in in Iraq's Misan City, entitled "Evaluation of the Knowledge Level of Nurses About Postpartum Haemorrhage" and revealed that more than half, nurses have correct nursing skills and practices about postpartum haemorrhage. Also, this finding was dissimilar to **Sallam et al. (2024)** who reported that the majority of the studied nurses had a poor level of practice. While only minority of the studied nurses had an average level of practice regarding guidelines for prevention of postpartum haemorrhage. This result was contraindicated with **Ali & Ghafel, (2022)** who conducted a study in the labor and delivery rooms of Holly Karbala City's Maternity Teaching Hospitals, about "Evaluation of Nurse-Midwive's Practices about

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Immediate Postpartum Care for Mothers" and demonstrated that w that the mean scores for items related to practices of mother's care; the mean score indicates that nurse-midwives showing poor level of practices among items.

Regarding to total practices regarding postpartum haemorrhage management in both groups at pre- and post-intervention phase, the present study shows that the majority of students in study group and more than half of students in control group had adequate practices regarding postpartum haemorrhage management compared to less than one quarter and more than one third of them respectively had inadequate practices regarding postpartum haemorrhage management. this result was in the same line with **Alaswad et al., (2024)** who carried out a study in in Iraq's Misan City, entitled "Evaluation of the Knowledge Level of Nurses About Postpartum Haemorrhage" and revealed that more than half, nurses have correct nursing skills and practices about postpartum haemorrhage. Also, this finding was dissimilar to **Sallam et al. (2024**) who reported that the majority of the studied nurses had a poor level of practice. While only minority of the studied nurses had an average level of practice regarding guidelines for prevention of postpartum hemorrhage. this result was contraindicated with **Ali &Ghafel, (2022)** who conducted a study in the labor and delivery rooms of Holly Karbala City's Maternity Teaching Hospitals, about "Evaluation of Nurse-Midwives' Practices about Immediate Postpartum Care for Mothers" and demonstrated that w that the mean scores for items related to practices of mother's care; the mean score indicates that nurse-midwives showing poor level of practices among items. from the researcher point of view, the substantial improvement in the study group's practices post-intervention demonstrates the effectiveness of simulation-based education in enhancing both performance and self-confidence regarding postpartum hemorrhage management.

Considering self-confidence of the students towards postpartum haemorrhage management, the result indicated that there was a significant difference between the self-confidence of the study group and control group in all items of self-confidence. As regards, the majority of the study group agreed that it is his responsibility as the student to learn what he need to know from this method of training and know how to use activities to learn critical aspects of these skills versus about two thirds and more than half of control group respectively. These results were agreed with **Teixeira et al. (2022)** who carried out a study in the south of Brazil about"Satisfaction and self-confidence of nursing students as participants and observers in realistic simulations" mentioned that most of the students had agreed with that it is his responsibility as a student to learn what I need to know through simulation. . Also, the findings of the current study are consistent with the findings of a previous simulation study, which found simulation strategies, especially the use of high-fidelity simulation, are effective in improving nursing students and reducing anxiety when caring for patients, and the clinical nursing skills could be improved in a non-threatening and safe environment **(Craft-Blacksheare & Frencher, 2018; Labrague et al., 2019).**Furthermore, the researchers found that clinical simulation experiences led to even greater confidence and satisfaction when conducted in a laboratory setting nursing skills **(Alharbi & Alharbi, 2022).**

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As regards to studied students' total self-confidence regarding postpartum haemorrhage management in both groups, the present study findings demonstrated that the majority of students in study group and more than half of students in control group were confident regarding postpartum haemorrhage management compared to minority and less than half of the students respectively were in confident regarding postpartum hemorrhage management. this result was in the same line with **Abd Elhakm & Elbana, (2018)** who conducted the study in Clinical Obstetric Skill lab of Faculty of Nursing, Benha University, about "Effect of Simulation Based Training on Maternity Nurses' Performance and Self-confidence Regarding Primary Postpartum Hemorrhage Management" showed that the majority of the studied nurses had confident related to postpartum haemorrhage management. Also, this result was similar to **Hussein et al.,(2023)** who revealed that illustrates that more than one third of intern nurses had high level of satisfaction before simulation training. While most of intern nurses had high level of satisfaction after simulation training. this result was dissimilar to **Abd El-hamid et al., (2021)** who indicated that the most of both study and control group were not confident about their skills before implementation of the training program. On the other hand, the majority respectively of the study group revealed self-confidence immediately and one month after implementation of the training program compared to minority respectively among the control group. this result may be due to that the simulation training was a safe learning environment where nursing students can master competencies which foster the nursing students' self-confidence and in turn improve satisfaction.

Concerning correlation between studied students ' total knowledge score, total practices score and total self-confidence score regarding postpartum haemorrhage management at post intervention phase, the current study clarified that there was a highly significant statistical positive correlation between studied students' total knowledge score, total practices score and total self-confidence score regarding postpartum haemorrhage management at post intervention phase. This result is in accordance with **Hashem et al., (2022)** in their study entitled "Effect of High-Fidelity Simulation on Intern Students' Competency regarding Clinical Guidelines for Active Management of the Third Stage of Labor" demonstrated that a highly significant positive correlation between total knowledge, practice, and self-confidence scores among the studied intern nursing students pre, immediately and one month post simulation training program. Also, this result was consistent with **MURAT ÖZTÜRK et al., (2023)** who conducted a study in turkey about "Using in Situ Simulation to Develop Knowledge and Skills of Midwives in Postpartum Haemorrhage Management: Amasya- Şanlıurfa Example" and stated that after the educational intervention, a statistically significant increase was found in the knowledge, practice, and Self-Confidence. Again, this result was strongly supported by **Hussein et al., (2023)** who showed that there was a statistically positive correlation between total knowledge score and total practices, competency, satisfaction, and self-confidence scores before and after simulation training. Moreover, this result was in harmony with **Abd El-hamid et al., (2021)** who documented that significant positive correlation is observed between students' total score of self-confidence and total score of knowledge

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immediately after implementation of the training program in the study group.

Conclusion

Based on the results of simulation based education supported the research hypothesis and achieved the current study that the maternity nursing students 'who attended the simulation based educational program achieved higher score of knowledge , practice and attitude as compare to their mean pre test scores .

Recommendations

Based on the results of the present study the following recommendations are suggested:

Recommendations for further research studies:

It is advised that high-fidelity simulation be incorporated into the maternity nursing education curriculum, with a specific focus on postpartum hemorrhage management.

Further recommendation:

- Provide targeted training for educators in high-fidelity simulation technology and effective debriefing methods. This ensures that educators are well-prepared to conduct simulations and offer valuable feedback..

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