Effect of Implementing Training Program Based on Simulation versus Video on Nursing Students' Performance Regarding Care during Normal Labor

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Abstract

Background: Care for the women during labor needs skillful and well prepared health care providers including maternity nursing students. Therefore, clinical teaching is an opportunity for nursing students to apply and develop problem solving strategies and critical thinking. There are varieties of clinical teaching methods which include; simulation and interactive video based training. **The aim of this study:** was to evaluate the effect of implementing training program based on simulation versus video on nursing students' performance regarding care during normal labor. **Subjects and method:** The study was conducted at the Clinical Obstetrics Laboratory Skills of Faculty of Nursing, Tanta University. **Subjects:** A simple random sample of 170 nursing students, third academic year were included in this study out of 600 students during the first semester 2022-2023, before attending the clinical labor section. They were divided into two equal study groups. **Two tools** were used for data collection; **Tool (I):** Nursing students' knowledge regarding normal labor. **Tool (II):** Observational checklist of nursing students' practices regarding care during normal labor. **Results:** The findings of the present study revealed that simulation based training program was more effective than video based training program in improving nursing students' performance regarding care during normal labor immediately and one month later compared to preprogram implementation. **Conclusion:** Nursing students' performance regarding care during normal labor was higher after simulation-based training program than video-based training program. **Recommendations:** Simulation refreshing courses, workshops and conferences based on the evidence based practice should be provided for maternity nurses to improve their knowledge and practice regarding care during normal labor. Evaluate the impact of simulation on knowledge retention, transferability to parturient women situations and maternal & neonatal outcomes.

Keywords: Normal Labor, Simulation, Video, Performance

Introduction

Childbirth is the most pleasurable and major event in a woman's life. It is the physiological process of coordinated effective sequence of involuntary uterine contractions that result in cervical effacement and dilatation as well as voluntary bearing down effort leading to expulsion of conception products including the fetus, membranes, umbilical cord and the placenta. **(Cunningham et al., 2022)**. The progress of labor is measured by changes in the cervical dilatation to allow fetus to be expulsed from the birth canal. Successful labor and delivery depends on the mechanism of normal labor, which includes seven cardinal movements occur in a vertex presentation. These are engagement, descent, flexion, internal rotation, extension, external rotation (restitution) and expulsion. **(Thornton et al., 2020).**

Maternity nurse has a vital role in the management of normal labor. A comprehensive high quality nursing care of the parturient woman requires adequate technical skills, communication and teamwork. **(Babigumira et al., 2017).** Today, fewer maternity nursing students have the opportunity to provide care for laboring women in the actual clinical setting due to several factors such as; lack of knowledge, skills, preparation and exposure of the maternity nursing students' for the clinical setting. (**Bergstrom et al., 2021).**

Clinical teaching is a hallmark of nursing education which pivotally important in the development of competency in clinical practice. There are a variety of clinical teaching methods that may be applied in the clinical setting. **(Challa et al., 2021).** It is of great importance to select the most

appropriate teaching methods for nursing education to make the training more interesting and more effective. These methods include; lecture, group discussion, demonstration and re-demonstration, role playing, case study, brain storming, problem solving, simulation and interactive videos based training. **(Radha & Narayanan, 2019).**

Simulation-based training is one of the innovative teaching strategies that have increasingly incorporated into clinical nursing education. It is the most important trend in nursing education today as a way to move from learning to doing. This method aims to replicate real-life experience to develop students' knowledge and skills within a safe environment. **(Rajaguru & Park, 2021)**.

In addition, interactive video based training is an important teaching strategy that becomes more prominent in the world of education. Using videos in education make it possible to overcome practical real-world constraints. **(Sablić et al., 2021).** Educational videos can use moving images to teach procedures which require skilled techniques and specialized physical examination. So, the innovative teaching methods should be used in clinical nursing education especially care during normal labor. (**Almuslamani et al., 2020**).

Significance of the study:

It is vital for maternity nursing educators to investigate the effectiveness of new learning technologies like simulation and video based training in practical achievement, in order to provide the maternity nursing students with the best teaching and learning methods to improve their clinical skills to render the highest quality of obstetrical care. Consequently, this will keep women safe and offers the

opportunity for students to practice clinical tasks in a safe and reassuring environment. **(Azizi et al., 2022).** Thus, it is very important to evaluate the effect of implementing training program based on simulation versus video on nursing students' performance regarding care during normal labor.

The aim of this study was to:

Evaluate the effect of implementing training program based on simulation versus video on nursing students' performance regarding care during normal labor.

Research Hypotheses:

1. Nursing students' performance is expected to be improved after implementation of simulation based training program regarding care during normal labor.
2. Nursing students' performance is expected to be improved after implementation of video based training program regarding care during normal labor.
3. Nursing students' performance regarding care during normal labor is expected to be improved after implementation of simulation based training program more than video based training program and vice versa.

Operational definitions:

Simulation based training: refers to structured student learning experiences with the use of a technologically advanced computerized mannequin that require design, administration, and role play enhancement of dynamic real-life clinical scenarios.

Normal Labor:

Normal labor in this study was included the second and third stage of labor.

Subjects and method:

Technical design:

I) Design:

A quasi-experimental research design was used to conduct this study. **(Bärnighausen et al., 2017).**

II) Setting:

The study was conducted at the Clinical Obstetrics Laboratory Skills of Faculty of Nursing, Tanta University which contains the following virtual simulation models:

-High fidelity birthing simulator (SimMom).

-Advanced childbirth simulator (S500).

III)   Subjects:

A simple random sample of 170 nursing students were included in this study out of 600 nursing students in the third academic year during the first semester 2022-2023, before attending the clinical labor section. The students were selected from the previously mentioned setting. The sample size was calculated based on type I error (α) 5%, 95% confidence limit and 80% power of the study.

Unlimited population:

$$CI = \hat{p} \pm z \times \sqrt{\frac{p(1-p)}{n}}$$

Finite population:

$$CI' = \hat{p} \pm z \times \sqrt{\frac{\hat{p}(1-\hat{p})}{n'} \times \frac{N-n'}{N-1}}$$

Where

- **z** is z score. Z-score is a statistical measurement that describes a value's relationship to the mean of a group of values.
- **$\hat{p}$** is the population proportion.
- **n** and n' are sample size.
- **N** is the population size.

They were divided into two equal study groups:

Group (1): Simulation based training: Consisted of 85 students who received theoretical and clinical simulation based training program regarding the second and third stages of labor.

Group (2): Video based training: Consisted of 85 students who received theoretical and clinical video based training program regarding the second and third stages of labor.

IV) Tools of data collection:

Two tools were used for data collection to achieve the aim of this study:

Tool (I): Nursing students' knowledge regarding normal labor:

It was developed by the researcher after reviewing the recent relevant literatures **(Thornton et al., 2020 ; Farahat et al., 2021)** and it comprised two main parts as follows:-

Part 1: Socio demographic characteristics of the studied nursing students:

This part was included: name, age, sex, residence, marital status, previous participation in simulation and video training programs as well as what it was about?

Part 2: Assessment of nursing students' knowledge regarding normal labor:

This part was included 30 open ended questions to assess nursing students' knowledge regarding normal labor as follows:

- **Nursing students' knowledge regarding normal labor:**

It included**:** definition, characteristics, factors affecting, premonitory signs and symptoms of labor, types of labor pain, differences between types of labor pain, sure signs of labor , characteristics of normal uterine contractions during labor (8 items) and stages of labor (first (7 items),

second (5 items), third (8 items) and fourth stage of labor (2 items)).

Scoring system of knowledge was categorized as follows:

- Correct and complete answers were scored as (2).

- Correct and incomplete answers were scored as (1).

- Incorrect answers or didn't know were scored as (0).

The total score of knowledge was calculated as follows (0- 60):

- High level of knowledge ≥ 80%. (48 - 60)

- Moderate level of knowledge 60% - <80%. (36 - <48)

- Low level of knowledge <60%.

  (0 - < 36)

Tool (II): Observational checklist of nursing students' practice regarding care during normal labor:

This tool was adapted by the researcher from **(AbdElfattah et al., 2019; United States Agency for International Development (USAID), 2008).** It was contained a standardized steps or tasks of each procedure during the second and third stages of labor as follows:

Nursing management during the second stage of labor:

It involved 8 items which contained 23 sub-items observed by the researcher to assess nursing students' practice regarding care during the second stage of labor. These included: preparation of the delivery room (3 items), preparation of the women (2 items), put the woman in the proper position (1item), maintain infection control measures (7 items), assess the uterine contraction and fetal heart rate (5 items), proper bearing down (2 items), assess the

fetal membranes' condition (1 item), and maintain perineal support (2 items).

Nursing management during the third stage of labor:

It involved 9 items which contained 56 sub-items observed by the researcher to assess nursing students' practice regarding care during the third stage of labor. These included: perform active management of the third stage of labor (16 items), clamp the umbilical cord at proper time (3 items), monitor the signs of placental separation (1 item), assess the amount of blood loss (3 items), perform placental examination (7 items), examine the birth canal after delivery (4items), provide immediate care of the newborn (10 items), perform episiotomy care (11 items) and documentation (1 item).

Scoring system of nursing students' practice was categorized as follows:

- Done correctly and completely was scored as (2).

- Done correctly and incompletely was scored as (1).

- Done incorrectly or not done at all was scored as (0).

The total scores of nursing students' practice were added and obtained for each nursing student who ranged from (0-158) then summed up as well as, converted into a percent score.

The total score of nursing students' practices regarding care during normal labor was classified as follows:

- Satisfactory practice ≥ 80%. (126.5-158)
- Unsatisfactory practice < 80%. (0 - < 126.5)

Method

– **Administrative steps:**

An official permission and approval clarifying the purpose of the study was obtained from dean of the Faculty of Nursing, Tanta University to conduct the study at the Clinical Obstetrics Laboratory Skills.

– **The actual study (field work):**

Data were collected through a quasi-experimental research design of 170 nursing students during the first semester of the third academic year 2022-2023 at the Faculty of Nursing, Tanta University.

– **Operational procedure:**

The study was implemented according to the following steps:

A. Tools development:

Two tools were used to collect data of this study. **Tool (I)** was developed by the researcher after review of recent relevant literatures. **Tool (II)** was adapted by the researcher from **(AbdElfattah et al., 2019; United States Agency for International Development (USAID), 2008)** and used for data collection including; **Tool (I) Part 1:** Socio demographic characteristics of the studied nursing students, **Tool (I) Part 2:** Assessment of nursing students' knowledge regarding normal labor. **Tool (II):** Observational checklist of nursing students' practice regarding care during normal labor. The study tools were tested for content and construct validity by a jury of five experts in the field of Maternal and Neonatal Health Nursing and modifications were done accordingly. Tools reliability was tested by calculating Cronbach's alpha from data collected in the pilot study. The alpha value was found to be 0.98 indicating high reliability of the study tool.

B. Ethical and legal considerations:

Approval of faculty of medicine research ethics committee was obtained (code 35485/5/22) and approval of faculty of nursing scientific research ethical committee was obtained (code 69/6/2022). Then, the researcher introduced herself to the students, and explained the aim of the study to obtain their acceptance and cooperation, as well as their informed consent. The right to withdraw from the study at any time was respected. The researcher ensured that the nature of the study didn't cause any harm or pain for the entire sample. The students were assured regarding the privacy and confidentiality of the collected data which was used only for the purpose of this study.

C. The Pilot Study:

After development of the tools, a pilot study was carried out before the actual data collection on 10% of the studied nursing students (17 nursing students) to ascertain the clarity, feasibility and applicability of the tools. Consequently, the necessary modifications, and/ or rephrasing, were done according to the results of the pilot study. Then the tools were made ready for use. Data obtained from the pilot study was included in the current study sample because no major changes were occurred.

D. The training program was conducted through four phases: assessment, planning, implementation and evaluation as follows:

Phase I: Assessment phase (Pre-test):-

− This phase was done before implementation of the simulation and video based clinical training program. It was conducted in the Clinical Obstetrics Laboratory Skills of the third academic year Faculty of Nursing, Tanta University, which contained high fidelity birthing simulator (SimMom), advanced childbirth simulator (S500), video recordings, and data show projector.

− The students were assessed by the researcher three times; before, immediately, and one month after implementation of the simulation and video based clinical training program.

− The studied students were assessed using Tool (I) Part (1) was used to collect socio-demographic data and Part (2) was used to collect students' knowledge regarding normal labor for the two groups.

− Nursing students' knowledge was assessed individually for each nursing student's in the presence of the researcher for any clarification. The time needed to fulfill this tool ranged from 15-20 minutes.

− Tool (II) was used by the researcher for each nursing students individually in the two groups to assess their practice regarding care during normal labor before, during as well as one month after implementation of the training program through an observational checklist.

Phase II: Planning phase:-

− **Setting the goal and objectives of the training program:**

The goal of the training program was to:

- Enhance nursing students' performance regarding care during labor.

- **Objectives of the training program:**

- Identify definition, premonitory sign and symptoms and difference between true and false labor pain.

- Determine factors affecting labor progress and knowledge regarding the different stages of labor.

- Demonstrate nursing management of the second and third stages of labor.

– **Program development phase:** Simulation and video based training programs were entailed two main parts:

1. Theoretical part: It was selected based on the training program objectives and students' needs guided by relevant literatures. The theoretical part was included knowledge regarding normal labor (definition, characteristics, factors affecting, premonitory sign and symptoms, difference between true and false labor pain, stages of labor, partogram, and mechanism of labor). It was provided by the researcher for the two study groups (simulation and video-based training groups).

2. Clinical part:

a. Group 1 (simulation based training group) was received the simulation based training and scenarios regarding care during normal labor at the Clinical Obstetrics Laboratory Skills that were prepared by the researcher.

b. Group 2 (video based training group) was received the video based training regarding care during normal labor at the Clinical Obstetrics Laboratory Skills by using video recording with the data show projector that were prepared by the researcher.

Phase III: Implementation phase:-

- The simulation and video based training groups obtained the training program within two consecutive days / week for two weeks. The first week included the theoretical part that was presented by the researcher into two sessions. The second week included the clinical part that was presented by the researcher into two sessions at the Clinical Obstetric Laboratory Skills. The total numbers of simulation and video based training groups

(85 nursing students for each group). Each training group was divided into four subgroups; the first, second and third subgroups included 21 nursing students, and the fourth subgroup involved 22 nursing students. The duration of each session ranged from 30 to 45 minutes.

- **The simulation and video based training sessions were as the following:**

The first session (theoretical session):

– The aim of this session was to provide the nursing students with the basic general knowledge regarding normal labor. It included definition, characteristics, factors affecting normal labor, premonitory signs and symptoms of normal labor, types of labor pain, differences between types of labor pain, sure signs, and characteristics of normal uterine contractions during labor. It also included definition, duration, and signs, and nursing management of the first stage of labor, definition, objectives (values), and components of the partogram. It was followed by feedback from nursing students.

The second session (theoretical session):

– The aim of this session was to provide the nursing students with the basic knowledge about definition, duration, signs of second and third stage of labor, mechanism of normal labor, nursing management of second stage of labor, signs of placental separation, mechanism of placental delivery, active management of third stage of labor, importance of placental examination, number of umbilical cord veins and arteries, as well as definition and nursing management of the fourth stage of labor. It was followed by feedback from nursing students.

The third session (clinical session):

‒ The aim of this session was to provide a brief orientation to the nursing students about high fidelity birthing simulator (SimMom) and advanced childbirth simulator (S500), its learning objectives, as well as to provide a brief orientation about video recording with the data show projector and the expectation of each session.

‒ This session also aimed to provide the nursing students with practical skills regarding nursing management during the second stage of labor.

‒ **The fourth session (clinical session):**

‒ The aim of this session was to provide the nursing students with practical skills regarding nursing management during the third stage of labor. Demonstration was performed by the researcher by using the high fidelity birthing simulator (SimMom) for group (1) as well as the researcher explained each step with video recording for group (2) during clinical sessions (third and fourth session) and re-demonstration after the end of the session was done by the nursing students.

IV: Evaluation phase (Post-test):

‒ Nursing students' performance regarding care during normal labor was assessed immediately after implementation of the simulation and video based training program and one month later by using Tool (I) Part 2 and Tool (II).

‒ A comparison between the two study groups was done regarding the effect of implementing training program based on simulation versus video on nursing students' performance regarding care during normal labor.

Statistical analysis:

The collected data were organized, coded, categorized, tabulated and statistically analyzed using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and median. Significance of the obtained results was judged at the 5% level.

Results:

Table (1): Shows socio-demographic characteristics of the studied nursing students (the two groups). It was observed that the simulation group age ranged from 20 – 22 years; with **a Mean age ± SD** of 20.62 ± 0.72 corresponding to age ranged from 20 – 22 years, with **a Mean age ± SD** of 20.82 ± 0.82 of the video group. As regards to their sex, (63.5%) of the simulation group were females and (67.1%) of the video group were females. Regarding their residence, (51.8%) of the simulation group were from urban areas and (69.4%) of the video group were from rural areas with a statistically significant difference (P= 0.005*).

Moreover, the table also reveals that the vast majority (96.5% and 98.8 % respectively) of the simulation and video groups were single. Finally, it was found that about (95.3% and 90.6% respectively) of the simulation and video group didn't previously participate in any simulation and video training programs.

Figure (1): Portrays overall total score level of the studied nursing students' knowledge (the two groups) regarding normal labor before, immediately and one month after implementation of the training

program. It was evident that (12.9 %, 92.9 % and 85.9 % respectively) of the simulation group had high level of knowledge regarding normal labor before, immediately and one month after implementation of the training program compared to (15.3 %, 80 % and 78.8 % respectively) of the video group had high level of knowledge regarding normal labor before, immediately and one month after implementation of the training program with highly statistical significant difference ($\chi2= 7.053$, P = 0.022*).

Figure (2): Portrays total score level of the studied nursing students' practice (the two groups) regarding nursing management during the second stage of labor before, immediately and one month after implementation of the training program. It was observed that (20%, 97.6% and 94.1% respectively) of the simulation group had satisfactory practice regarding nursing management during the second stage of labor before, immediately and one month after implementation of the training program compared to (23.5%, 82.4% and 75.3% respectively) of the video group had satisfactory practice regarding nursing management during the second stage of labor before, immediately and one month after implementation of the training program with highly statistical significant difference ($\chi2= 11.046$, P = 0.001* and $\chi2=11.624$, P =0.001*).

Figure (3): Demonstrates total score level of the studied nursing students' practice (the two groups) regarding nursing management during the third stage of labor before, immediately and one month after implementation of the training program. It was revealed that (16.5 %, 95.3% and 87.1 % respectively) of the simulation group had satisfactory practice regarding nursing

management during the third stage of labor before, immediately and one month after implementation of the training program compared to (21.2 %, 81.2% and 75.3 % respectively) of the video group had satisfactory practice regarding nursing management during the third stage of labor before, immediately and one month after implementation of the training program with highly statistical significant difference ($\chi2= 8.160$, P = 0.004* and $\chi2=3.850$, P =0.049*).

Figure (4): Shows overall total score level of the studied nursing students' practice (the two groups) regarding care during normal labor before, immediately and one month after implementation of the training program. It was noticed that (20 %, 94.1% and 87.1 % respectively) of the simulation group had satisfactory practice regarding care during normal labor before, immediately and one month after implementation of the training program compared to (23.5 %, 80 % and 77.6 % respectively) of the video group had satisfactory practice regarding care during normal labor before, immediately and one month after implementation of the training program with highly statistical significant difference ($\chi2= 7.518$, P = 0.006*).

Table (2): This table illustrates the relation between the studied nursing students (the two groups) overall total score level of knowledge regarding normal labor and their socio-demographic characteristics before, immediately and one month after implementation of the training program. It was revealed that there was statistical significance relation between simulation group' overall total score level of knowledge and their sex and residence before implementation of the training

program as P- value = (0.030* and 0.033* respectively).

Table (3): This table clarifies the relation between the studied nursing students (the two groups) overall total score level of practice regarding care during normal labor and their socio-demographic characteristics before, immediately and one month after implementation of the training program. It was revealed that there was statistical significance relation between simulation group' overall total score level of practice and previous participation in simulation and video training programs before implementation of the training program as P- value = (0.024*). The table also reveals that there was statistical significance relation between simulation group' overall total score level of practice and their sex immediately after implementation of the training program as P- value = (0.018*).

Table (4): Shows the correlation between the studied nursing students (the two groups) overall total score level of knowledge and overall total score level of practice regarding care during normal labor before, immediately and one month after implementation of the training program. A significant positive correlation was found between simulation group' overall total score level of knowledge and overall total score level of practice regarding care during normal labor immediately and one month after implementation of the training program where r= 0.847 and P= <0.001* , r=0.915 and P= <0.001* respectively.

Finally, a significant negative correlation was also found between video group' overall total score level of knowledge and their overall total score

level of practice regarding care during normal labor immediately after implementation of the training program where r= - 0.513 and P=<0.001*.

Table (1): Socio-demographic characteristics of the studied nursing students (the two groups) (n= 170).

Socio-demographic Characteristics	Simulation group (n = 85)		Video group (n = 85)		χ^2	p
	N	%	N	%		
Age (years):						
20	44	51.8	37	43.5	3.710	0.156
21	29	34.1	26	30.6		
22	12	14.1	22	25.9		
Range	20 – 22		20 – 22		t= 1.687	0.093
Mean ± SD	20.62 ± 0.72		20.82 ± 0.82			
Median	20		21			
Sex:						
Male	31	36.5	28	32.9	0.234	0.629
Female	54	63.5	57	67.1		
Residence:						
Rural	41	48.2	59	69.4	7.869*	0.005*
Urban	44	51.8	26	30.6		
Marital status:						
Single	82	96.5	84	98.8	1.024	FEp= 0.371
Married	3	3.5	1	1.2		
Previous participation in simulation and video training programs:						
No	81	95.3	77	90.6	1.435	0.231
Yes (Nasal suction)	4	4.7	8	9.4		

χ^2: **Chi square test**　FE**: Fisher Exact**　　*: Statistically significant at p ≤ 0.05
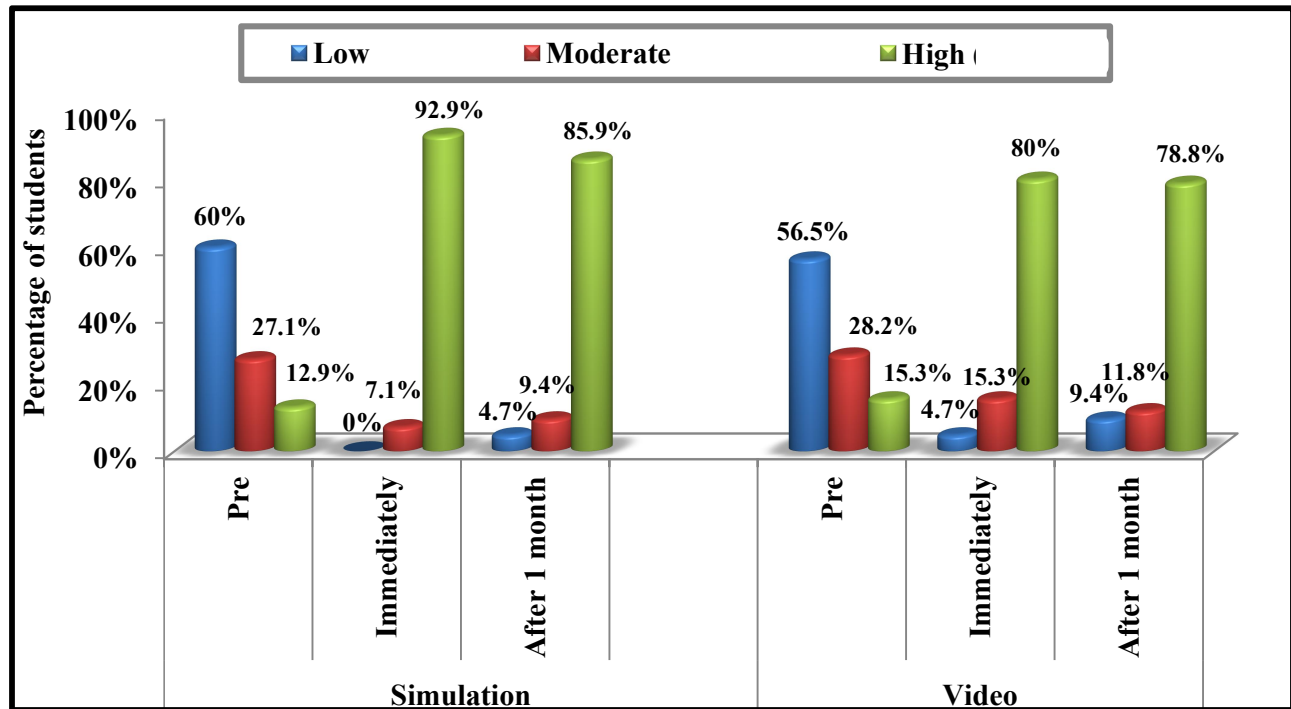
Figure (1): Overall total score level of the studied nursing students' knowledge (the two groups) regarding normal labor before, immediately and one month after implementation of the training program (n=170).
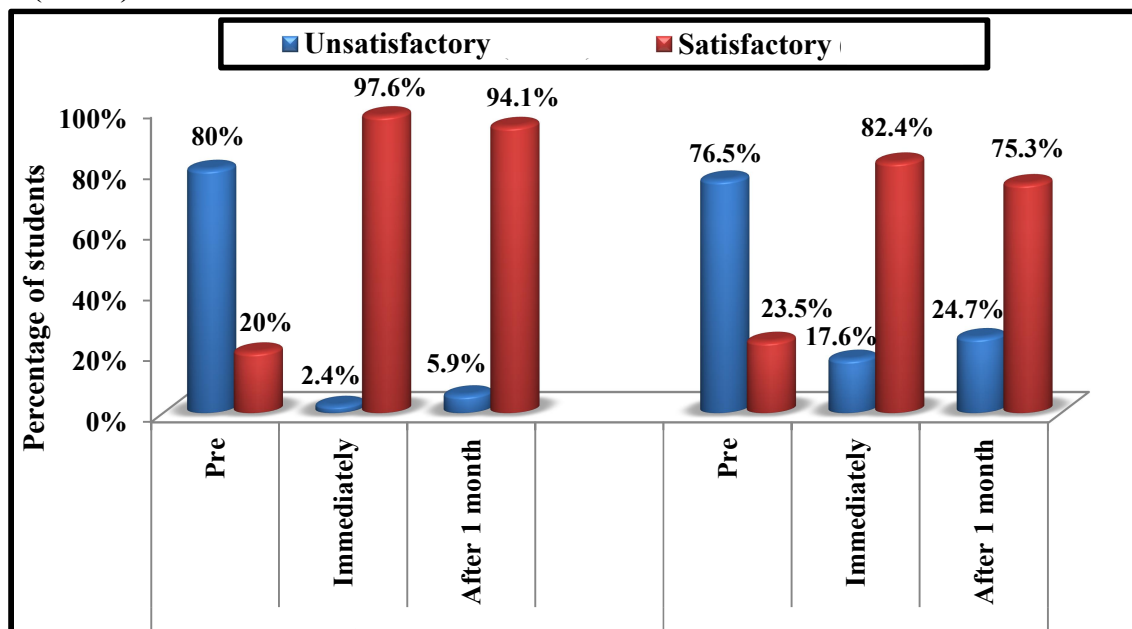

Figure (2): Total score level of the studied nursing students' practice (the two groups) regarding nursing management during the second stage of labor before, immediately and one month after implementation of the training program (n=170) .
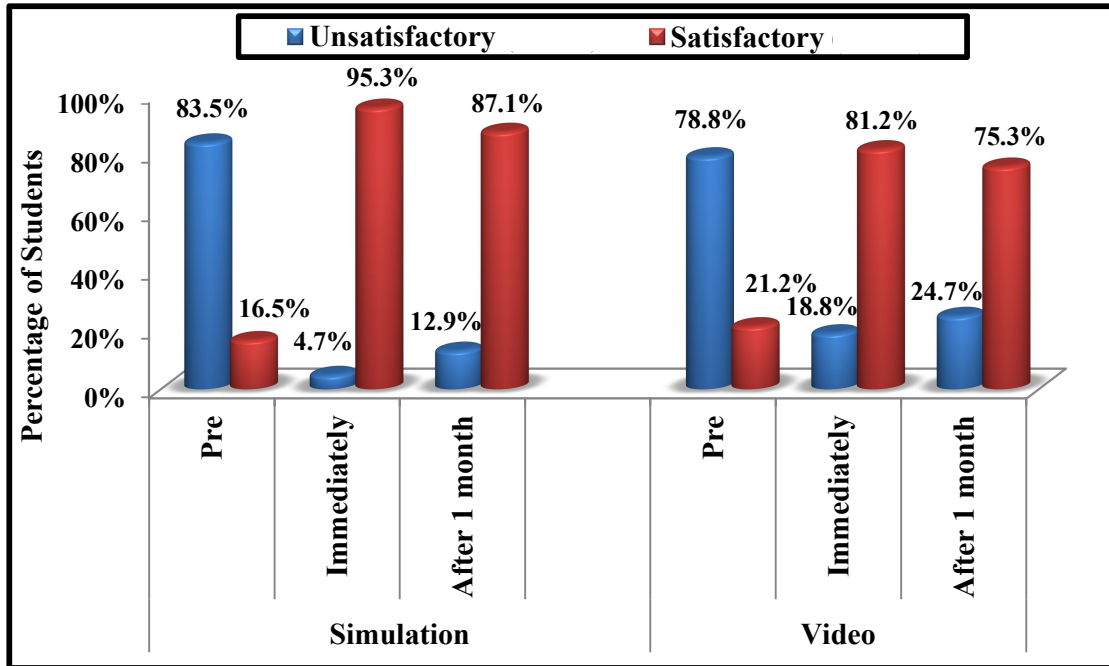
Figure (3): Total score level of the studied nursing students' practice (the two groups) regarding nursing management during the third stage of labor before, immediately and one month after implementation of the training program (n=170) .
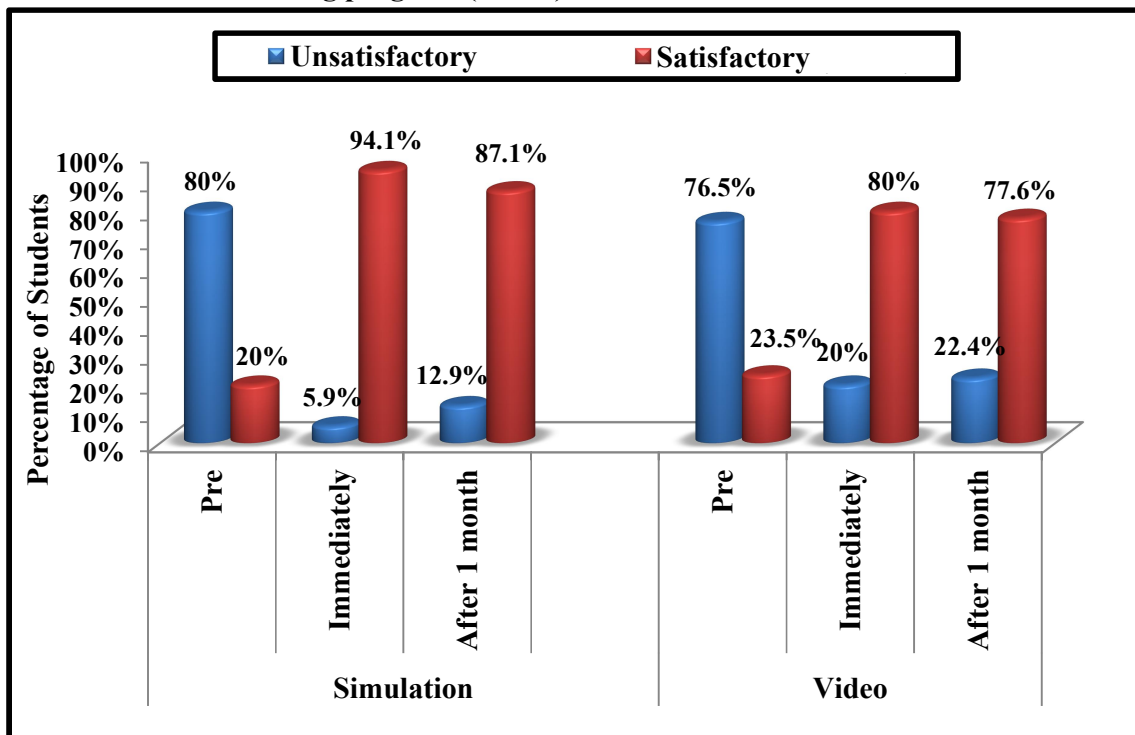

Figure (4): Overall total score level of the studied nursing students' practice (the two groups) regarding care during normal labor before, immediately and one month after implementation of the training program (n=170) .

Table (2): Relation between the studied nursing students (the two groups) overall total score level of knowledge regarding normal labor and their socio-demographic characteristics before, immediately and one month after implementation of the training program (n= 170).

Socio-demographic characteristics	Overall total score level of knowledge					
	Simulation group (n = 85)			Video group (n = 85)		
	Before program	Immediately after program	One month after program	Before program	Immediately after program	One month after program
Sex						
χ^2	7.028*	2.427	2.638	2.927	0.209	0.872
P	0.030*	0.185	0.269	0.231	1.000	0.706
Age						
χ^2	3.263	1.841	4.597	3.850	2.143	3.175
P	0.527	0.415	0.273	0.431	0.773	0.538
Residence						
χ^2	6.843*	2.577	1.356	3.097	0.651	1.560
P	0.033*	0.204	0.579	0.213	0.802	0.529
Marital status						
χ^2	1.175	0.236	0.696	3.817	1.951	1.565
P	0.692	1.000	1.000	0.157	1.000	1.000
Previous participation in simulation and video training programs						
χ^2	0.394	2.059	2.027	2.082	1.267	0.697
P	1.000	0.258	0.455	0.334	0.557	0.812

χ^2: **Chi square test**　　　　　*: Statistically significant at $p \leq 0.05$

Table (3): Relation between the studied nursing students (the two groups) overall total score level of practice regarding care during normal labor and their socio-demographic characteristics before, immediately and one month after implementation of the training program (n= 170).

Socio-demographic characteristics	Overall total score level of practice					
	Simulation group (n = 85)			Video group (n = 85)		
	Before program	Immediately after program	One month after program	Before program	Immediately after program	One month after program
Sex						
χ^2	1.028	8.066	0.440	0.050	0.053	2.306
P	0.311	0.018*	0.520	0.823	0.817	0.129
Age						
χ^2	0.331	3.734	4.109	1.757	3.909	5.791
P	0.847	0.129	0.129	0.415	0.142	0.055
Residence						
χ^2	0.424	1.696	2.224	0.004	0.014	0.451
P	0.515	0.361	0.136	0.948	0.906	0.502
Marital status						
χ^2	0.777	0.194	0.462	0.311	0.253	0.291
P	1.000	1.000	1.000	1.000	1.000	1.000
Previous participation in simulation and video training programs						
χ^2	7.936*	2.771	0.542	0.011	0.138	1.167
P	0.024*	0.219	0.432	1.000	0.658	0.370

χ^2: **Chi square test**   ***: Statistically significant at p $\leq$ 0.05**

Table (4): Correlation between the studied nursing students (the two groups) overall total score level of knowledge and overall total score level of practice regarding care during normal labor before, immediately and one month after implementation of the training program (n= 170).

Overall total score level of practice	Test of significance	Overall total score level of knowledge regarding normal labor					
		Simulation group (n = 85)			Video group (n = 85)		
		Before program	Immediately after program	One month after program	Before program	Immediately After program	One month after program
Nursing management during the second stage of labor	**r**	-0.095	0.764*	0.849*	0.098	-0.521	-0.129
	p	0.388	<0.001*	<0.001*	0.372	<0.001*	0.238
Nursing management during the third stage of labor	**r**	-0.030	0.821*	0.858*	0.061	-0.486*	-0.206
	p	0.782	<0.001*	<0.001*	0.581	<0.001*	0.059
Overall practice regarding care during normal labor	**r**	-0.048	0.847*	0.915*	0.075	-0.513*	-0.203
	p	0.664	<0.001*	<0.001*	0.495	<0.001*	0.062

r: Pearson coefficient　　　　　　　　　　*: Statistically significant at p ≤ 0.05

Discussion

World Health Organization (WHO) has provided standards for nursing education and recommended the use of an innovative teaching strategy as simulation and video in nursing education. In maternal and neonatal health nursing education, simulation is an educational strategy that has the potential to engage nursing students in realistic learning environments where they can practice skills and care for women during labor without being overly concerned about harming the mother or her fetus. (**Fealy et al., 2023).** Therefore, this study was conducted to evaluate the effect of implementing training program based on simulation versus video on nursing students' performance regarding care during normal labor.

Regarding the socio-demographic characteristics of the studied nursing students, the findings of the present study revealed that the two groups' age ranged from 20 – 22 years with Mean age ± SD (20.62 ± 0.72) of the simulation group and Mean age ± SD (20.82 ± 0.82) among the video group. As regards their sex, more than three fifths of the simulation group was female and slightly more than two thirds of the video group was female. Regarding their residence, slightly more than half of the simulation groups were from urban areas and more than two thirds of the video group were from rural areas. Moreover, about (96.5% and 98.8 % respectively) of the simulation and video group were single. Finally, concerning previous participation in simulation and video training programs, it was found that about (95.3% and 90.6% respectively) of the simulation and video group didn't participate in any simulation and video training programs.

This finding of the present study is matching with the study of **Erenel et al., (2021)** about "effect of scenario-based simulation training on the obstetrics and gynecology nursing clinical practicum" who indicated that Mean age ± SD of the simulation group were 20.50 ± 0.68. Again this finding is consistent with **Abd El Hameed et al., (2018)** who investigated" effect of simulation on maternity nursing students' perception, satisfaction and self-confidence". They found that the minority of the studied nursing students with age 22 years old with Mean age ± SD of 20.76 ± 0.68 and the vast majority of them were single. From the researcher point of view, the similarity between the findings of the present study and the above studies may stem from they shared the same circumstances (all nursing students as well as in the third academic year).

On the other hand, the finding of the present study is not matching with the findings of **Son (2023)** who studied "effects of simulation with problem-based learning (S-PBL) on nursing students' clinical reasoning ability: based on tanner's clinical judgment model" who stated that Mean age of the nursing students was 23.48. Also the finding of the present study is not in harmony with the findings of **Azizi et al., (2022)** who investigated "a comparison of the effects of teaching through simulation and the traditional method on nursing students' self-efficacy skills and clinical performance: a quasi-experimental study". They concluded that the simulation group consisted of less than three fifths of girls and more than two fifths were boys.

World Health Organization (WHO) (2018) reported that the maternity nurses who offer care to women during labor must have a base of knowledge that guides them to accomplish their nursing practice. Continuing education provides maternity nursing students to be up to date with current development to maintain their competence and to meet the standards of nursing practice. Therefore, this study is intended to enhance the nursing students' knowledge and practice regarding care during normal labor.

Referring to, overall total score level of the studied nursing students' knowledge regarding normal labor, the present study revealed improvement in the total score level immediately and one month later compared to before implementation of the training program but the improvement was higher in the simulation group than the video group. This result may be probably due to the immediate effect of the training program. However, one month later, the studied nursing students' scores were somewhat reduced but still significant which may be probably due to the absence of the continuing training and education as well as other curriculum overload.

The present study findings strongly agree with **Nomura et al., (2023)** who conducted a study titled " obstetric simulation for undergraduate medical education: how to improve students' self-confidence and expectation according to gender". They stated that knowledge of the students were significantly higher at the end of the training period in all items of the questionnaire than in the beginning. They concluded that, obstetric simulation enhances the improvement of students'

self-confidence in understanding the obstetric care procedures.

At the same time, the present study findings were consistent with **Sami et al., (2019)** of a study titled " simulation-based training to improve obstetric / perinatal nurses competency in managing obstetric emergencies in Saudi Arabia (KSA) ". They declared that the majority of their study participants had high knowledge after the simulation training was statistically significantly as ($P < 0.001$). Again this finding is also similar to **Amin et al., (2019)** study titled "effect of video assisted teaching regarding normal labour on anxiety among primi parturient mothers" who reported that the majority of video group had good knowledge about normal labour at post intervention than before the intervention .

Furthermore, the finding of the present study is matching with **Hassan et al., (2018)** who investigated " nursing students' achievement in normal labor: impact of simulation modules". They reported that there was significant improvement and high knowledge in both study and control groups regarding normal labor, after intervention phases compared to pre-intervention phase. However, the improvement was higher and more significant in the simulation group. The similarity between the previous study and the finding of the present study may stem from the high fidelity simulation helps to improve students' learning and increase the retention of their knowledge through active simulation learning.

Nursing is a profession that needs lifelong learning to keep up with struggling of dynamic healthcare setting which surround nursing practices in current century.

Maternity nursing students need continuous education to provide safe level of practice and expand their level of competency as professionals. Therefore the maternity nursing students who strive for providing safe, quality patient care must continuously seek to expand the professional knowledge and practice. **(Mlambo et al., 2021).**

Regarding the total score level of the studied nursing students' practice regarding nursing management during the second stage of labor, the majority of the studied nursing students in the present study had unsatisfactory practice level before implementation of the training program which significantly improved immediately and one month after implementation of the training program. The current finding is consistent with the results of **Pajohideh et al., (2023)** study titled "the effects of normal vaginal birth simulation training on the clinical skills of midwifery students: a quasi-experiment study". They reported that the vast majority of the students in the intervention group (simulation group) were at a good and excellent skill level post intervention.

Regarding overall total score level of the studied nursing students' practice regarding care during normal labor, the majority of the studied nursing students in the present study had unsatisfactory practice level before implementation of the training program which significantly improved immediately and one month after implementation of the training program. **In the same line,** the finding of the present study is relatively in accordance with **Azizi et al., (2022)** who portrayed that the mean of nursing students' clinical performance increased significantly after the intervention. The findings indicated that simulation teaching significantly affects nursing students' clinical performance. The current finding is also consistent with the results of **Nakanakupt & Jaichaun (2022)** study titled " impact of interactive delivery- demonstration video on undergraduate nursing students' knowledge, confidence, delivery skills, and satisfaction with the video". They reported that the video group achieved a significantly higher mean score than the control group regarding delivery practice skills.

The findings were also compatible with **Akalin & Sahin (2020)** who studied "obstetric simulation in undergraduate nursing education: An integrative review". They declared that the simulation method was a safe and effective teaching strategy.The use of obstetric simulation in an undergraduate nursing program has a positive effect on the student practice. **Additionally,** the findings of the present study are aligning with **Chang et al., (2019)** who investigated "effects of spherical video-based virtual reality on nursing students' learning performance in childbirth education training". They concluded that the learning motivation and learning satisfaction of the students who learned with Spherical Video-based Virtual Reality (SVVR) were better, showing the potential of this powerful medium for enhancing nursing students' learning performance in the context of childbirth education. The similarity between the result of the present study and above mentioned study may be due to students of the simulation group had given a chance for demonstration and make a mistake and re-demonstration and correction of their

mistakes that had led to gaining confidence of improving practical skills.

The findings of the current study had revealed a significant positive correlation was found between simulation group' overall total score level of knowledge and overall total score level of practice regarding care during normal labor immediately and one month after implementation of the training program Finally, a significant negative correlation was also found between video group' overall total score level of knowledge and their overall total score level of practice regarding care during normal labor immediately after implementation of the training program .

The current study finding is consistent with the results of **Mohammed et al., (2023)** study titled "effect of simulation training on intern nurses' competence and self-confidence regarding primary postpartum hemorrhage". The study reported that there was a statistically positive correlation between total knowledge score and total practice scores after simulation training. This finding is supported by the results of **Bhutia et al., (2018)** who evaluated "knowledge and practice of active management of third stage of labour (AMTSL) among nursing students in selected hospitals, Gangtok, Sikkim". They stated that there was a positive correlation between knowledge and practice of active management of third stage of labor among nursing students.

Finally, the findings of the present study, concluded that the research hypothesis which stated that "nursing students' performance regarding care during normal labor improved after implementation of simulation based training program more

than video based training program" has been achieved, this was revealed through the significant improvement of nursing students' performance regarding care during normal labor immediately and one month later compared to pre simulation based training program implementation. Consequently, it is confirmed that simulation based training program is an effective strategy to improve the knowledge and practice level of the studied nursing students.

Conclusion

Based on the findings of the present study, it can be concluded that:

- **The research hypotheses have been achieved, this was revealed through the following:**

- Implementation of training program based on simulation versus video resulted in a significant improvement of nursing students' performance regarding care during normal labor compared to pre training program implementation.

- Simulation based training program was more effective than video based training program in improvement of the nursing students' performance regarding care during normal labor immediately and one month later compared to pre training program implementation.

Recommendations

Based on the findings of the present study, the following recommendations are suggested:-

- Planning and conducting training programs for nursing students regarding care during normal labor using simulation in order to improve, update and refresh their knowledge and qualify their practices dependent on recent evidence based guidelines during labor.

- Use of simulation and video in combination with the traditional teaching methods for more enhancements of the nursing students' knowledge as well as skills accomplishment level for rapid effective nursing management during normal labor.
- Written policies, protocol of care and guidelines should be developed for improving the quality of nursing care rendered to parturient women.
- Determination whether knowledge and skills acquired from simulation-based training is sufficient for achievement of high quality nursing care.
- Determination the impact of simulation-based training program on the nursing students' satisfaction level.

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