Effect of Competency-Based Education on Interns Nursing Students' Performance Regarding Active Management of Third Stage of Labor

Nehmedo Ezzat Osman[1], El- Shaimaa El-Ansary[2], Shaimaa Hassan Mohamady[3]

[1,2] Lecturer of Woman's Health and Midwifery Nursing, Faculty of Nursing, Mansoura University, Egypt.

[3] Assistant Professor of Maternal and Newborn Health Nursing Department, Faculty of Nursing, Helwan University, Egypt.

Corresponding author: Nehmedo Ezzat Osman   **E-mail: Nehmedo @mans.edu.eg**

ABSTRACT

Background: Active management of third stage of labor (AMTSL) is a vital possession for nurses to prevent postpartum hemorrhage (PPH). Internships offer carefully planned, monitored work experience which allows the opportunity to apply knowledge and skills in a professional setting. **Aim:** To evaluate the effect of competency-based education on intern nursing students' performance regarding active management of third stage of labor. **Design:** A quasi-experimental design. **Sample:** A convenient sample of 60 female intern nursing students who practiced their internship year in the Faculty of Nursing, Mansoura University in the academic year (2021/2022). **Setting:** The delivery unit at Mansoura University Hospital, Egypt. **Tools:** A self-administered questionnaire, AMTSL practical observational checklist, AMTSL attitudes assessment sheet, and satisfaction Likert scale. **Results:** Statistically significant improvements in intern students' knowledge, attitudes, and practical skills regarding AMTSL immediately post-intervention and follow-up were found. Furthermore, total intern students' knowledge and practices pre-intervention, immediately-post, and follow-up were positively correlated. About three-quarters of the intern students were satisfied with the clinical training method post-intervention. **Conclusion:** Competency-based education was effective in improving the knowledge, attitudes, and practices of intern nursing students regarding AMTSL which translated into higher satisfaction scores. **Recommendations:** Continuous competency-based education should be conducted for students to improve their knowledge, attitudes, and practices regarding AMTSL.

Keywords: Competency-Based Education, Performance, Interns Nursing Students.

Introduction

The third stage of labor (TSL) is the period between baby delivery and placenta delivery. If its duration exceeds 18 minutes, the woman will be at risk for PPH; and if it lasts more than 30 minutes, the risk increases 6-fold. Globally PPH is the most common factor of high mother deaths taking place in 10.5% of births. It can be complicated by shock, renal impairment, coagulation disorders, and Sheehan's syndrome **(Ahmed, Saleh, Abd Elhameid, and Badr, 2020; Bhutia, Shadap, and Pangambam, 2018)**.

However, PPH is a preventable obstetric emergency prohibited by AMTSL which is prophylactic management based on an evidence-based, low-cost intervention. It includes a package of 3 elements, uterotonic drug administration, controlled cord traction (CCT), and massage of the uterus after placental delivery **(Muzeya and Julie, 2020)**.

Meanwhile, the gap that existed between knowledge and practices can produce low-quality healthcare services in practical areas **(Hakimi, Kheirkhah, Abolghasemi, Hakimi, and Farshad, 2019)**. To help future nurses meet the demands of the workplace and profession and promote the quality of intrapartum care, student nurses must acquire adequate knowledge and skills to perform AMTSL **(Amasha, Abdel-Haleem, and Gamal, 2020; Bhutia et al., 2018; Tan, Chan, Subramaniam, and Ping, 2018)**.

Intern nursing students should be trained using modern educational methods such as the competency-based education (CBE) model **(Hakimi et al., 2019)**. It is an advanced technique used by higher education institutions that organize academic content according to competencies; what a student should know and perform, instead of adhering to a conventional course **(Oroszi, 2020)**.

Competency-based education is also a performance-based and student-centered approach that improves the students' performance skills to specific standards by practice and demonstration **(Hakimi et al., 2019)**. It helps to increase the relevance of student education to a job in the future. This requires active student engagement in all aspects of care to demonstrate competence in AMTSL **(Muzeya and Julie, 2020)**. Moreover, internships offer carefully planned monitoring experience which allows students to apply their knowledge and skills in a professional setting, achieve performance improvement, and maintain healthcare organization efficiency **(Ezz et al., 2021)**. Therefore, interns students should be highly knowledgeable and well-trained caregivers for women's safety and well-being **(Ramadan, Abd El Hady, and El Sharkawy, 2019)**.

Significance of the study

The third stage of labor is the most threatening stage due to PPH risk **(Bhutia et al., 2018)**. About 14 million women around the world suffer from PPH yearly **(WHO, 2021)**. In 2017, the maternal mortality ratio in Egypt was

estimated as 37 deaths per 100,000 live births. PPH accounted for 20% of them **(Demographics., 2021; Vlassoff, Abdalla and Gor., 2020)**. Reduction of maternal mortality is a priority in the third goal of the 2030 Sustainable Development Goals regards achieving health and well-being for all. Strategies for Ending Preventable Maternal Mortality (EPMM) published by WHO are focusing on reducing the inequities that cause disparities in access and quality of health care among countries. The EPMM strategies are essential in creating high-performing healthcare systems needed to ensure high-quality care services. In practice, PPH as a major cause of maternal death can be prevented by effective AMTSL **(Center of Excellence in Maternal and Child Health., 2021; Jolivet et al., 2018)**. AMTSL is a key element of PPH prevention strategies all over the world **(Bhutia et al., 2018; Muzeya and Julie., 2020).**

Competency-based education is an emerging trend in nursing education that allows students to advance and master skills at their workplace by focusing on their performance and abilities. It offers degree advancement at a significant time and cost savings. It has been widely applied in medicine, pharmacy, engineering, and nursing. It revealed an improvement in students' knowledge and practical skills and an increase in their learning satisfaction **(Tan et al., 2018)**. An Ethiopian study by **Alemu., (2021)** concluded that providing competency-based training is important to enhance the practice of TSL.

Although CBE has received global attention in the educational literature over the past 20 years and despite its acceptance, research that examined its impacts is limited **(Fan, Wang, Chao, Jane, and Hsu, 2015; Zaker, Hosseini, and Mohammad-Pour., 2017)**. Meanwhile, the nursing education mission is to create highly competent nurses with essential knowledge, attitudes, and practices. This stimulates the current study to determine the effect of competency-based education on interns nursing students' performance regarding AMTSL.

Aim of the study

The current study aimed to evaluate the effect of competency-based education on interns nursing students' performance regarding AMTSL through the specific objectives:
- Assess interns nursing students' knowledge regarding AMTSL.
- Assess interns nursing students' attitudes regarding AMTSL.
- Assess interns nursing students' practices regarding AMTSL.
- Assess interns nursing students' satisfaction with the competency-based education regarding AMTSL.

Research hypotheses
To achieve the study aim, the following hypotheses were designed:

1. Interns nursing students will be higher total knowledge scores

regarding AMTSL after implementing competency-based education.

2. Interns nursing students will exhibit positive total attitude scores regarding AMTSL after implementing competency-based education.

3. Interns nursing students will improve total practice scores regarding AMTSL after implementing competency-based education.

4. Interns nursing students will be high satisfaction scores regarding AMTSL after implementing competency-based education.

Operational definitions:

Competence: Knowledge, attitudes, and practices of interns nursing students regarding AMTSL.

Satisfaction: Interns nursing students' feelings of fulfillment and gratification with competency-based education regarding AMTSL.

Subject and methods:
Design:
A quasi-experimental with one group (pre-test and post-test). In the absence of randomization, the quasi-experimental design is mostly used to evaluate the effect of interventions (**Barnighausen et al., 2017**).

Setting:
This study was conducted in the delivery unit at Mansoura University Hospital, Egypt. It is located on the ground floor of the main building of the hospital with a capacity of 19 beds. The delivery unit has 6 rooms, one of them is the teaching room.

Sample:
A non-probability convenient sample of 60 female interns nursing students who practiced their internship year in the Faculty of Nursing, Mansoura University in the academic year (2021/2022) was obtained during their training (one month in delivery unit).

Study tools:

Tool I: A self-administered questionnaire: It was established by the researchers after reviewing the relevant literature (**Mahmoud and Omar, 2018**) and includes two parts: first part: interns' nursing student's general characteristics used to collect student's general characteristics such as age, residence, and attendance of any workshop related to normal labor. The second part includes interns

nursing students' AMTSL knowledge assessment sheet based on **WHO, (2012)** guidelines used to assess interns nursing students' knowledge regarding AMTSL. It comprises 15 multiple choice questions: concept of TSL, duration of TSL for both primigravida and multigravida, immediate role after delivery of the fetus, complications of the delayed TSL, a most common complication of TSL, an abbreviation of AMTSL, components of AMTSL, the primary aim of AMTSL, name of the uterotonic drug, dose & route of the uterotonic drug, time of administering the uterotonic drug, harmful practices when performing AMTSL, duration of completion of AMTSL. **Scoring system:** each item was scored as (1) for the correct answer and (0) for the incorrect answer. Items of knowledge were rated: good knowledge was a score of ≥70%, average knowledge was 50 %-69 %, while poor knowledge was a score of < 50% **(Ramadan, Abd El Hady, and El Sharkawy, 2019)**.

Tool II: AMTSL attitudes assessment sheet: It was adopted from **Yaekob, Shimelis, Henok, and Lamaro, (2015)** and used to assess interns nursing students' attitudes regarding AMTSL. It consists of 3 questions: is AMTSL useful, is AMTSL advantageous, and should AMTSL is used for all parturient women? **Scoring system:** each question was scored as (1) for the correct answer and (0) for the incorrect answer. Women who scored 3 marks (correct answer) rated positive attitude and those who scored less than 3 marks rated negative attitude.

Tool III: AMTSL practical observational checklist: It was adapted from **(ICM and FIGO guidelines, 2021; Lami & Deksisa, 2020)** to assess interns nursing students' practices regarding AMTSL. It consists of 44 items categorized into the following subdomains: emotional support, preparation, immediate care of the newborn, components of AMTSL (administration of a uterotonic drug, Controlled Cord Traction(CCT), uterine massage), examination of perineum and vagina, examination of the

placenta, infection prevention, decontamination, and disposal of waste. **Scoring system:** each item that performed was scored as (1) while the item that did not perform was scored as (0). Skills of the checklist were rated as highly competent (>80%), competent (80%), and incompetent (<80%) **(Kaur and Siddiqui, 2018)**.

Tool IV: Satisfaction Likert scale: It was developed by the researchers after reviewing the related literature **(Naghizadeh et al., 2014)** to assess interns nursing students' satisfaction with competency-based education regarding AMTSL. It includes 5 items concerning the educational methods: useful & effective, easy & clear, meeting students' expectations, making students interested to learn, and appropriate for the clinical setting. **Scoring system:** this scale utilized 3 points for assessing the level of satisfaction: (3) for satisfied, (2) for uncertainty, and (1) for unsatisfied. The total degree score ranged from 5 to 15. A high score means higher satisfaction.

Validity and reliability of the tools:

The developed tools were tested by 3 jury expertise specialized professors in maternity nursing for clarity, relevance, and applicability. The reliability was tested statistically by estimating their internal consistency using Cronbach's alpha coefficient. It was 0.852 for self-administered questionnaire, 0.894 for AMTSL attitudes assessment sheet and AMTSL practical observational checklist, and 0.877 for Satisfaction Likert scale.

Ethical considerations:
Official approvals were obtained from the director of Mansoura University Hospital and the dean of the Faculty of Nursing to conduct this study. Before implementation of the study, the students had been individually told about the study's nature and aim. Students were also assured of the obtained data's privacy and confidentiality. They were informed about their rights to withdraw from the study at any time without giving a reason.

Pilot study:
To test if the study tools were clear and applicable, a pilot study was conducted on 6 interns nursing students (10%) of the sample who

were excluded from the study. The rearrangement of some statements was made according to the findings.

Fieldwork:

This study was conducted between October 2021 and September 2022 through 4 phases: preparatory, assessment, implementation, and outcome evaluation phase.

Preparatory phase:

The researchers reviewed the relevant national and international literature related to aspects of AMTSL and the preparation of study tools.

Assessment phase:

1. The researcher attended the delivery unit on Sunday, Tuesday, and Thursday from 9 a.m. to 2 p.m. after taking the legal aspects of ethics in research. The researcher introduced herself to a group of female interns nursing students, explained the aim of the study, and obtained their informed consent before data collection. The sample was taken according to the distribution of the hospital for the delivery unit which was 5 nursing students monthly.
2. The interns nursing students' general data, knowledge, and attitudes regarding AMTSL were obtained using a self-administered questionnaire and AMTSL attitudes assessment sheet as a pretest. Students' practices during performing AMTSL were observed using AMTSL practical observational checklist.

Implementation phase:

Competency-based education was provided by the researcher in the form of 4 sessions (1 theoretical and 3 practical).

The theoretical session provided in the teaching class concerning third stage of labor definition & duration, signs of placental separation, AMTSL (aim & components), uterotonic drugs (name, dose & route), harmful practices when performing AMTSL, and duration of completion of AMTSL). PowerPoint presentation, supportive educational material, a lecture, and group discussion were used.

Practical sessions included an explanation of the AMTSL procedure provided by the researcher; **the first session** contained emotional support (2 steps), preparation (6 steps), and immediate newborn care (3 steps).

Emotional support for the woman: an explanation of what will happen and reassurance throughout the birth and during the immediate postpartum. Preparation: preparing the uterotonic drug such as oxytocin and other birth equipment, wearing a clean gown, overshoes, and eyeglasses, washing hands with soap and water and dryness, wearing sterile surgical gloves, asking empty the woman's bladder at the end of the first stage (if the woman cannot urinate with a full bladder, catheterization can be done), assisting the woman to take a comfortable position (semi-sitting or squatting). Immediate baby care: dryness of the newborn, ensuring that he is breathing (if don't at least 30 times/minute within 30 seconds of birth, resuscitation is needed), place him in skin contact with his mother, and put him in a warm towel.

The second session was about steps of AMTSL: step 1 a uterotonic drug administration (2 points): palpation of the uterus to ensure there is no other fetus and administration of oxytocin 10 IU intramuscular within 1 minute of delivery (oxytocin 5 IU can be given intravenous bolus slowly if the woman has an intravenous infusion). Step 2 CCT (9 points): clamping and cutting the cord about 2–3 minutes after delivery, placing the palm above the woman's pubic bone on the lower abdomen, keeping slight cord tension, applying gentle cord traction during a strong contraction, while applying abdominal counter pressure at the same time, repeating the step if the maneuver is unsuccessful after 30-40 seconds, when the placenta delivers, holding it and deliver the membranes by a gentle twisting movement, gently examine the cervix and upper vagina if the membranes cut, and put the placenta in a kidney basin. Step 3 uterine massage (4 points): immediately massage the fundus until the uterus is firm, ensuring that it became contracted, repeat the massage if it became soft, and teach the woman how to do it.

The third session included immediate postpartum care and examination of the placenta (7 points), prevention of infection (6 points), and care after placenta delivery (5 points). Immediate postpartum care: inspection and repairing of any lacerations or

tears of the lower vagina and perineum, repairing episiotomy (if performed), examining the maternal surface of the placenta and membranes for completeness and abnormalities, disposal of the placenta, removal of soiled bedding and making the woman comfortable, estimation of blood loss, and assisting the woman to begin breastfeeding within the first hour after birth. Infection prevention: waste materials disposal in a leak-proof container before removing gloves, needles and sharps disposal in a sharp's disposal container, cleaning gowns using a decontaminating solution, placing instruments in 0.5 % chlorine solution, disposal of gloves, and washing hands with soap and water and dryness. Care after placenta delivery: monitoring the mother and newborn in the first 2 hours after delivery (once per quarter or more often if needed), continuous mother and newborn routine care, and documentation of all findings and care provided.

Outcome evaluation phase:

The interns nursing students' knowledge, attitudes, and practices regarding AMTSL were evaluated by the researcher immediately post intervention and follow up at the end of the internship period in the delivery unit using a self-administered questionnaire, AMTSL attitudes assessment sheet, and AMTSL practical observational checklist respectively. In addition, the level of students' satisfaction with the competency-based education was evaluated once at end of the internship period in the delivery unit using satisfaction Likert scale.

Statistical analysis

Statistical tests were done using SPSS version 25.0. Mean $\pm$ SD were used to express continuous data. Frequency and percentage were used to express categorical data. The repeated Friedman test was used to determine the comparisons between more than two variables and continuous data. It was used to compare categorical data more than two times. Pearson correlation analysis was used to assess the inter-relationships among quantitative variables. Statistical significance was set at $P<0.05$.

Results

Table (1) shows that the mean age ±SD of the interns nursing students was 22.650 ± 0.860 and two-thirds (65%) of them were from rural areas. In addition, 33.3% of them attended training courses.

Table (2) shows that there were highly statistically significant differences between intern students' knowledge regarding AMTSL pre-intervention, immediately post, and follow-up.

Figure (1) displays that slightly more than two-thirds (66.7%) of the interns students had poor knowledge regarding AMTSL before implementation of the competency-based education compared to the majority (86.7%) who had good knowledge immediately after the intervention. While more than three-quarters (80.1%) had good knowledge at the follow-up evaluation. There was a statistically significant difference between intern students' total knowledge scores pre-intervention, immediately post, and follow-up with $P<0.05$.

Figure (2) highlights that most of the interns students (96.7%) had a negative attitude regarding AMTSL pre-intervention and decreased to 5% and 11.7% immediately post-intervention/follow-up respectively. Most students (95%) and the majority (88.3%) had a positive attitude immediately post-intervention/follow-up respectively. There was a highly statistically significant difference between total attitude scores regarding AMTSL pre-intervention, immediately-post, and follow-up with $P=0.001$.

As noted in Table (3), there were statistically significant differences between some domains (preparation, newborn care, CCT, uterine massage, and care of the placenta) of intern students' practice regarding AMTSL pre-intervention, immediately post, and follow-up with $P<0.05$ and highly statistically significant differences between the other domains (emotional support, administration of a uterotonic drug, postpartum care, and infection prevention) with $P<0.001$.

Figure (3) demonstrates a significant improvement in total practice scores regarding AMTSL immediately after the intervention, and at follow-up evaluation that only 3.3% of the interns students had competent practice pre-intervention compared to 95% and 93% immediately post-intervention/follow-up respectively. There was a statistically significant difference between intern students' total practice scores pre-intervention, immediately-post, and follow-up with $P=0.001$.

There was a statistically significant positive correlation between total intern students' knowledge and practices regarding AMTSL pre-intervention, immediately-post, and follow-up. Table (4).
Figure (4) shows that three-quarters (75.0%) of the interns' students were satisfied with competency-based education regarding AMTSL post-intervention.
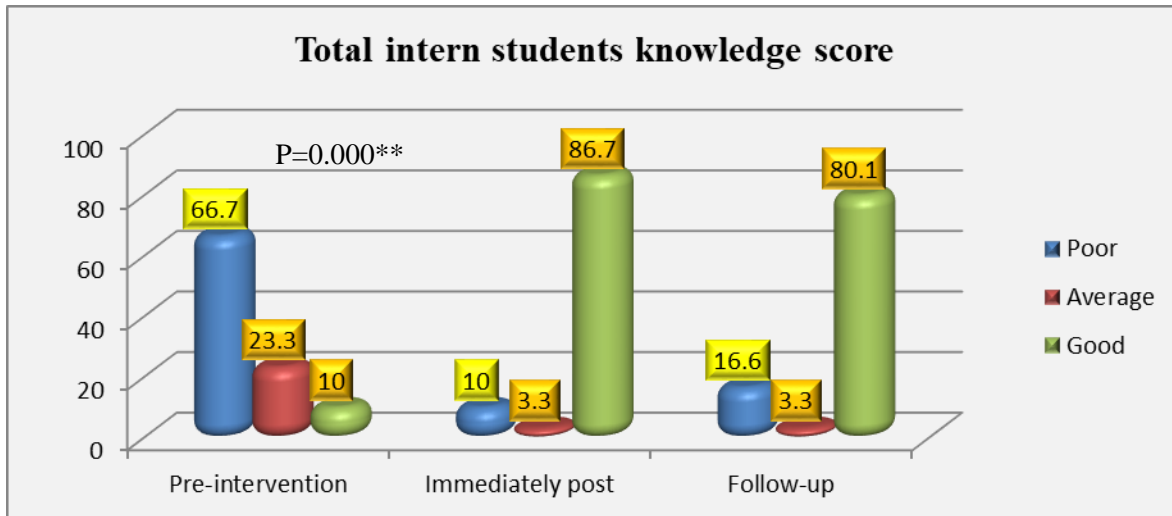
Table (1) General characteristics of the studied interns students (N = 60)

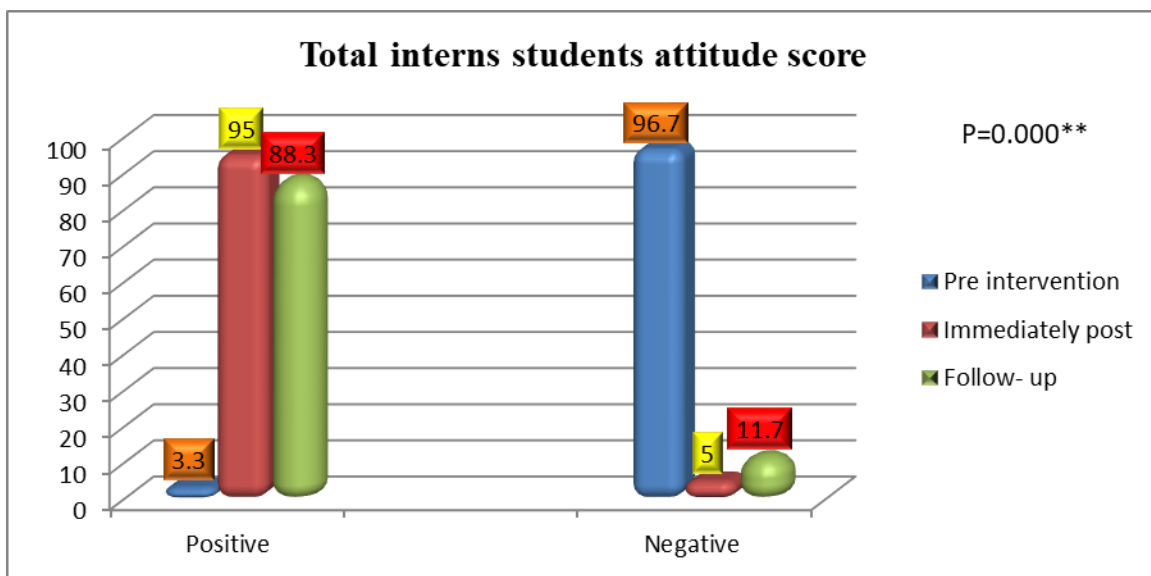| Items	No.	%
Age (years)		
Mean ± SD	22.650 ± 0.860	
Residence		
Urban	21	35.0
Rural	39	65.0
Attendance of training courses		
Yes	20	33.3
No	40	66.7

Table (2) Knowledge of the studied interns students regarding AMTSL pre-intervention, immediately post, and follow-up (N = 60)

Items	Pre-intervention				Immediately post				Follow- up				Significance test
	Incorrect		Correct		Incorrect		Correct		Incorrect		Correct		
	No	%	No	%	No	%	No	%	No	%	No	%	
1. Definition of third stage of labor (TSL)	21	35.0	39	65.0	2	3.3	58	96.7	22	36.7	38	63.3	X²=19.42, P=0.000**
2. Duration of TSL for multigravida	22	36.7	38	63.3	5	8.3	55	91.7	22	36.7	38	63.3	X²= 13.81, P=0.000**
3. Duration of TSL for primigravida	50	83.3	10	16.7	5	8.3	55	91.7	27	45.0	33	55.0	X²=67.97, P=0.000**
4. Immediate role after delivery of the fetus	32	53.3	28	46.7	3	5.0	57	95.0	25	41.7	35	58.3	X²=33.92, P=0.000**
5. Result of the delayed TSL	24	40.0	36	60.0	1	1.7	59	98.3	24	40.0	36	60.0	X²= 26.73, P=0.000**
6. Most common complication of TSL	26	43.3	34	56.7	18	30.0	42	70.0	26	43.3	34	56.7	X²=2.30, P=0.092
7. AMTSL abbreviation	17	28.3	43	71.7	1	1.7	59	98.3	30	50.0	30	50.0	X²=16.73, P=0.000**
8. Three main sequential components of AMTSL	41	68.3	19	31.7	3	5.0	57	95.0	36	60.0	24	40.0	X²=51.82, P=0.000**
9. Primary aim of AMTSL	34	56.7	26	43.3	1	1.7	59	98.3	24	40.0	36	60.0	X²=43.926, P=0.000**
10. First line uterotonic drug used in AMTSL	18	30.0	42	70.0	1	1.7	59	98.3	32	53.3	28	46.7	X²=18.072, P=0.000**
11. Recommended dose of this drug	43	71.7	17	28.3	3	5.0	57	95.0	35	58.3	25	41.7	X²=56.40, P=0.000**
12. Recommended route of this drug	36	60.0	24	40.0	5	8.3	55	91.7	23	38.3	37	61.7	X²= 35.60, P=0.000**
13. Time of drug administration	33	55.0	27	45.0	3	5.0	57	95.0	35	58.3	25	41.7	X²=35.71, P=0.000**
14. Harmful practice (s) when performing AMTSL	32	53.3	28	46.7	7	11.7	53	88.3	30	50.0	30	50.0	X²= 23.74, P=0.000**
15. AMTSL completion	37	61.7	23	38.3	6	10.0	54	90.0	23	38.3	37	61.7	X²= 34.83, P=0.000**
Total score Median Interquartile range	7 2				15 2				7 3				
Significance	Z=-12.938, P=0.000**												

Z refers to Wilcoxon Signed Ranks Test, X²= Friedman test, and ** refers to high significance if the P-value is less than 0.001.

Total intern students knowledge score

P=0.000**

Legend:
- Poor
- Average
- Good

Pre-intervention: Poor 66.7, Average 23.3, Good 10
Immediately post: Poor 10, Average 3.3, Good 86.7
Follow-up: Poor 16.6, Average 3.3, Good 80.1

Figure (1) Total knowledge scores of the interns nursing students regarding AMTSL pre-intervention, immediately post, and follow-up (N = 60)
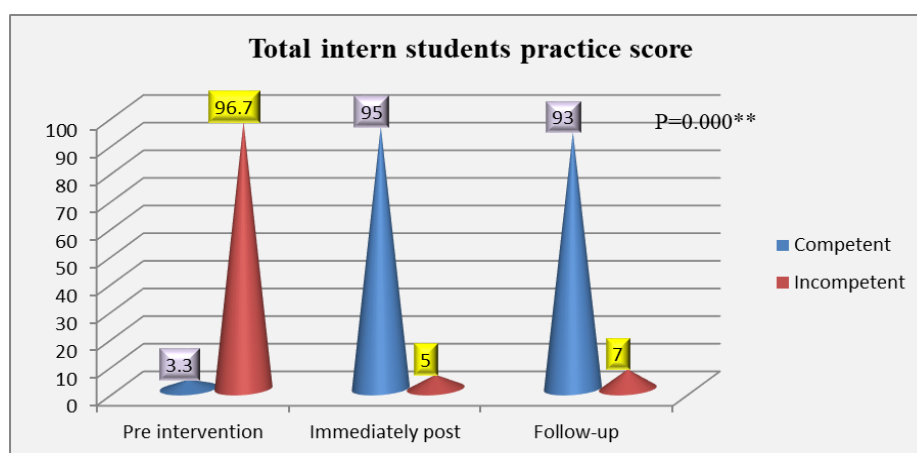
Total interns students attitude score

P=0.000**

Legend:
- Pre intervention
- Immediately post
- Follow- up

Positive: Pre intervention 3.3, Immediately post 95, Follow-up 88.3
Negative: Pre intervention 96.7, Immediately post 5, Follow-up 11.7

Figure (2) Total attitude scores of the studied interns students regarding AMTSL pre-intervention, immediately post, and follow-up (N = 60)

Table (3) Practice domains of the studied interns students regarding AMTSL pre-intervention, immediately-post, and follow-up (N = 60)

| Domains	Pre-intervention				Immediately-post				Follow- up				Significance Test
	Incompetent		Competent		Incompetent		Competent		Incompetent		Competent		
	No	%	No	%	No	%	No	%	No	%	No	%	
Emotional support	44	73.3	16	26.7	2	3.3	58	96.7	44	73.3	16	26.7	X^2=23.15, P= 0.000**
Preparation	58	96.7	2	3.3	10	16.7	50	83.3	59	98.3	1	1.7	X^2=9.13, P= 0.02*
Newborn care	54	90.0	6	10.0	12	20.0	48	80.0	50	83.3	10	16.7	X^2= 11.22, P= 0.035*
1: Administration of a uterotonic drug	38	63.3	22	36.7	5	8.3	55	91.7	33	55.0	27	45.0	X^2= 15.30, P= 0.000**
2: controlled cord traction(CCT)	58	96.7	2	3.3	47	78.3	13	21.7	58	96.7	2	3.3	X^2= 26.26, P= 0.008*
3: Uterine massage	60	100	0	0	10	16.7	50	83.3	54	90.0	6	10.0	X^2=19.11, P= 0.001*
Postpartum care	50	83.3	10	16.7	23	38.3	37	61.7	57	95.0	3	5.0	X^2= 33.33, P= 0.000**
Infection prevention	25	41.7	35	58.3	14	11.7	46	38.3	60	100	0	0	X^2=45.46, P= 0.000**
Care of placenta	51	85.0	9	15.0	9	15.0	51	85.0	51	85.0	9	15.0	X^2=21.24, P= 0.006*

* Refers to significance if the P-value is less than 0.05 X^2= Friedman test, and ** refers to high significance if the P-value is less than 0.001.

Figure (3) Total practice scores of the studied interns students regarding AMTSL pre-intervention, immediately post, and follow-up (N=60)

Table (4) Correlation between the studied interns students' total knowledge, attitudes, and practices regarding AMTSL pre-intervention, immediately- post, and follow-up (N=60)

Knowledge	Practice		Attitude	
	R	**p**	**r**	**p**
Pre-intervention	0.725	0.000**	-0.242	0.063
Immediately post	0.195	0.003*	0.195	0.135
Follow-up	0.112	0.017*	0.050	0.704
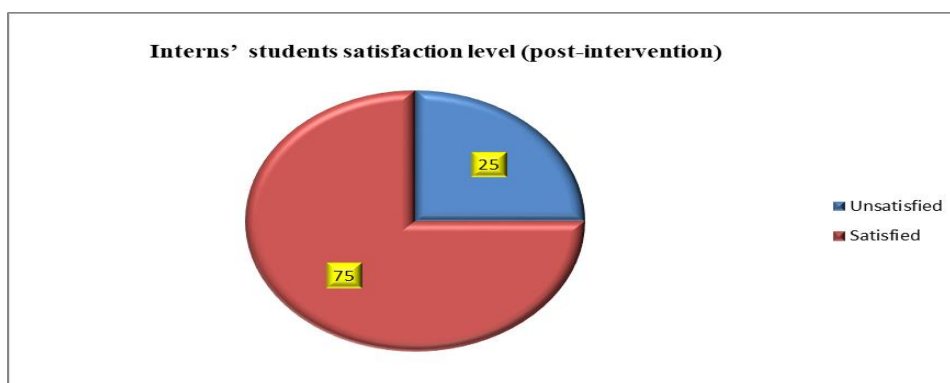
Figure (4) Satisfaction of the studied interns students with competency-based education regarding AMTSL post-intervention

Discussion

This study evaluated the effect of competency-based education on interns students' performance regarding AMTSL. There was a statistically significant improvement in total knowledge, attitudes, and practices scores of the interns students regarding AMTSL immediately post-intervention and at follow-up. There was also a higher percentage of interns students satisfied with the competency-based education. Therefore, the hypotheses of this study were supported.

The present study found highly statistically significant differences between students'

knowledge regarding AMTSL, pre-intervention, immediately post, and follow-up. In addition, statistically significant differences in total knowledge scores pre-intervention, immediately-post, and follow-up. This indicated the effectiveness of competency-based education on students' knowledge that will have a significant reflection on their achievement in the future. This is in the same line with **Hakimi, Kheirkhah, Abolghasemi, Hakimi, and Farshad, (2019)** who determined the effect of competency-based education on Iranian midwifery students based on the Kirkpatrick evaluation model. The researchers concluded that students' knowledge scores in all dimensions of the study group increased significantly at immediate and follow-up evaluation after the intervention than the control group.

Furthermore, **Laghezza, Clapper, Christos, Sharma, and Naik, (2019)** measured the effect of a competency-based education conference model for physician assistants and nurse practitioners in the United States and reported significant increases in medical knowledge for the clinical procedures post-intervention. They also demonstrated that this model could enable continuing education and a commitment to personal growth and achievement, unlike lecture-based conferences. This is also confirmed in a study by **Naga, Bedier, Salem, Ahmed, and Elhfnawy, (2021)** conducted in Alexandria to assess effectiveness of an educational program based on competency regarding care of patients with stroke on knowledge, skills, and attitudes of nurses. It

revealed a highly statistically significant improvement in the nurse's knowledge immediately and 2 months after the implementation of the program.

As regards the students' attitudes regarding AMTSL, the current study revealed that there was a highly statistically significant difference between total attitude scores pre-intervention, immediately-post, and follow-up. Most students had a positive attitude immediately post-intervention. This could be due to the improvement of their knowledge which in turn positively affects their attitudes. This finding is important since positive attitudes would improve students' employability in the current and future job market and stimulate continuous learning.

This finding is similar to **Wu, Wang, Wu, and Guo, (2014)** who applied a nursing core competency teaching for training 42 undergraduate students. They found that the performance of students in the experimental group was significantly higher than those of the control group. **Fan, Wang, Chao, Jane, and Hsu, (2015)** also conducted a quasi-experimental study in Taiwan to examine the effects of competency-based education on the learning outcomes of undergraduate nursing students. They reported that students who received competency-based education had significantly higher academic performance in the nursing course than did the control group. They also concluded that competency-based education helps to close the gap between education and the changeable work

environment. It promotes relevant skills for nursing training.

Regarding the students' practices of AMTSL, statistically significant differences between some domains and highly statistically significant differences between the other domains pre-intervention, immediately-post, and follow-up. As well as a significant improvement in total practice scores immediately after the intervention, and at follow-up evaluation. It is evident that education makes changes in performance and improves practice-related outcomes, thereby achieving knowledge translation. As it is known, knowledge is one of the modifiable factors that have an indirect relationship with individual practices. Consequently, the designed educational intervention promotes the incorporation of best evidence into the practices.

In this regard, **Zaker et al., (2017)** showed an improvement in the behavioral skills of students in the intervention group after competency-based education. This finding is in agreement with **Kadam, Dasila, and Gopalkrishnan, (2017)** who demonstrated that the majority of the nursing personnel had good practices level regarding infection control after competency-based education. Moreover, **Valizadeh, Mohammadpour, Parvan, and Lakdizaji, (2009)** stated that after implementation of the outcome-based education, the mean behavioral skills of the intervention group was significantly higher than that of the control group.

As is shown, competence-based education was effective in promoting students' performance by empowering students to create and apply knowledge and prove their acquired competencies. **Kimario and Otieno, (2022)** in their study concluded that competency-based curriculum implementation is essential for the student's future career development through self-employment, creativity, and expansion of multiple competencies necessary for sustainable development. They recommended that a competency-based curriculum should be effectively implemented in all secondary schools for students to develop the necessary skills needed for personal transformation. Such similarity was observed in a study by **van Griethuijsen, Kunst, van Woerkom, Wesselink, and Poell, (2019)** which indicated that implementation of competency-based education to some degree, better prepares students for their future workplace.

The current study revealed a statistically significant positive correlation between total intern students' knowledge and practices regarding AMTSL pre-intervention, immediately-post, and follow-up. This result is in accordance with the study of **Naga, Bedier, Salem, Ahmed, and Elhfnawy, (2021)** which mentioned that the studied nurses' knowledge and skills at the follow-up phase were positively correlated. **Wake and Wogie, (2020)** also confirmed the same result in a previous study. This result is contrary to **Yaseen, Fatima, Ramzan, Quasar, and Ara, (2021)** who studied nurses' knowledge and practices regarding AMTSL in certain Kashmir hospitals. They stated

that there was no correlation between knowledge and practice among the study subjects.

The present study showed that a high percentage of the interns students were satisfied with competency-based education post-intervention. This could be due to the use of different teaching methods and media such as demonstration, re-demonstration, and videos which were helpful and effective to teach students how to perform the procedures correctly. The teaching material was also simple and clear. This result is in line with the result of **Morrison, (2018)** which indicated that most learners were extremely satisfied with their decision to enroll in competency-based education. It concluded that higher education institutions need to pay more attention to this learning pathway's knowledge-building capabilities. This finding is also supported by **Succar, McCluskey, and Grigg, (2017)** who showed a higher degree of students satisfaction in the experimental group compared to the control group after implementing a competency-based curriculum. This is also consistent with **van Griethuijsen et al., (2019)** who concluded that competency-based education had a positive effect on students' satisfaction with quality of education, guidance, and development of interpersonal skills.

Conclusion

This study showed that competency-based education was effective in improving the knowledge, attitudes, and practices of the intern nursing students regarding AMTSL which translated into higher satisfaction scores. The hypotheses and aim of the study were supported by the results.

Recommendations

- Continuous competency-based education should be conducted for students to improve their knowledge, attitudes, and practices regarding AMTSL.
- Competency-based education should be adopted to enhance students' performance in other different maternity nursing subjects.

Further studies:

- Examination of factors affecting students' level of competencies, such as self-efficacy, communication skills, and achievement motivation.
- Evaluation of students' progress in attaining competencies from graduation to being newly qualified nurses by a longitudinal study (follow-up study).
- Replication of this study in another nursing course in a different setting.

Acknowledgment

Conflicts of interest

No conflict of interest was declared.

References

Ahmed, R., Saleh, A., Abd Elhameid, A., and Badr, M. (2020). Incidence and outcome of primary postpartum hemorrhage at Zagazig University Hospitals. Zagazig University Medical Journal, 26(6), 970. https://doi.org/10.21608/zumj.2019.14733.134.

Alemu, B. (2021). Third stage of labor practice and associated factors among skilled birth attendants working in Gamo and Gofa Zone public health facility, Southern, Ethiopia. Ethiopian Journal of Reproductive Health, 13(2). https://ejrh.org/index.php/ejrh/article/view/438

Amasha, H., Abdel-Haleem, S., and Gamal, A. M. (2020). Assessing the competence of nurses in rendering postpartum care and its effect on womens satisfaction. The Malaysian Journal of Nursing, 11(4), 99-110. https://doi.org/10.31674/MJN.2020.V11I04.011.

Barnighausen, T., Tugwell, P., Ratingen, J. A, Shemilt, I., Rockers, P., Geldsetzer, P., and Bor, J. (2017). Quasi-experimental study designs series—paper 4: uses and value. Journal of clinical epidemiology, 89, 21-29.

Bhutia, S., Shadap, A., and Pangambam, S. (2018). Knowledge and practice of Active Management of Third Stage of Labour among nursing students in selected hospitals, Gangtok, Sikkim. International Journal of Nursing & Midwifery Research, 5(4), 59-66. https://doi.org/10.24321/2455.9318.201849.

Center of Excellence in Maternal and Child Health. (2021). The Sustainable Development Goals and Maternal Mortality. https://www.mhtf.org/topics/the-sustainable-development-goals-and-maternal-mortality.

Demographics. (2021). Egypt maternal mortality rate - Demographics. IndexMundi. https://www.indexmundi.com/egypt/maternal_mortality_rate.html

Ezz, I., Hamedo, S., Metwally, S., Mohamed, E.(2021). Effect of emergency obstetric protocol on the performance of interns nursing students. Egyptian Journal of Health Care, 3(12), 999-1011.

Fan, J. Y., Wang, Y., Chao, L., Jane, S.-W., and Hsu, L.-L. (2015). Performance evaluation of nursing students following competency-based education. Nurse Education Today, 35, 97‑103. https://doi.org/10.1016/j.nedt.2014.07.002.

Hakimi, M., Kheirkhah, M., Abolghasemi, J., Hakimi, R., and Farshad, F. (2019). The effect of competency-based education in obstetric emergencies on midwifery students in clinical skill lab, based on Kirkpatrick evaluation model: A randomized controlled trial. bioRxiv. https://doi.org/10.1101/695791

International Confederation of Midwives, International Federation of Gynecology and Obstetrics. (2021). Prevention and treatment of postpartum hemorrhage. Joint statement of recommendation for the use of uterotonics for the prevention of postpartum hemorrhage. June 2021. Accessed September 2021. https://www.figo.org/joint-statement recommendation-uterotonics-prevention-pph.

Jolivet, R. R., Moran, A. C., O'Connor, M., Chou, D., Bhardwaj, N., Newby, H., … Langer, A. (2018). Ending preventable maternal mortality: Phase II of a multi-step process to develop a

monitoring framework, 2016-2030. BMC Pregnancy and Childbirth, 18(1). https://doi.org/10.1186/S12884-018-1763-8

Kadam, M., Dasila, P., and Gopalkrishnan, S. (2017). Effect of competency-based education on infection control practices of labor room nurses in Raigad District, Maharashtra, 7, 224‑231.

Kaur, S. and Siddiqui, A. (2018). Assessment of knowledge and skills of GNM students regarding active management of third stage of labor. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 7(9), 3814.

Kimario, T., & Otieno, K. (2022). Effects of Competency-Based Curriculum on Students' Education Achievement: A Study of Secondary Schools in Arusha City Council, Tanzania. Center for Research Implications & Practice, 6(1), 201‑210. Repéré à www.jriiejournal.com

Laghezza, M., Clapper, T. C., Christos, P. J., Sharma, R., & Naik, N. (2019). Measuring the effect of a competency-based education conference for PAs and NPs. Journal of the American Academy of Physician Assistants, 32(9), 44‑47. https://doi.org/10.1097/01.JAA.0000578772.3918 0.0c

Lami, H., & Deksisa, A. (2020). Knowledge and Practice towards Active Management of Third Stage of Labour, among Obstetric Care Providers Adama Town Governmental Health Facilities, Oromia, Ethiopia From September 12 to November 08 2019. American Scientific Research Journal for Engineering, Technology, and Sciences , 73(1), 128‑142. Repéré à

https://asrjetsjournal.org/index.php/American_Sci entific_Journal/article/view/6189/2265

Morrison, C. M. K. (2018). College Choice and Competency-Based Education Learner Motivations. ProQuest Dissertations and Theses, 230. Repéré à http://ezphost.dur.ac.uk/login?url=https://search.p roquest.com/docview/2048222688?accountid=14 533%0Ahttp://openurl.ac.uk/ukfed:dur.ac.uk?genr e=dissertations+%26+theses&issn=&title=Colleg e+Choice+and+Competency-Based+Education+Learner+Motivations&volume =&i

Muzeya, F., & Julie, H. (2020). Student midwives' knowledge, skills and competency in relation to the active management of the third stage of labour: A correlational study. Curationis, 43(1). https://doi.org/10.4102/CURATIONIS.V43I1.205 4

Naga, M., Bedier, N., Salem, M., Ahmed, H., & Elhfnawy, A. (2021). Effect of Competency Based Program on Nurses' Knowledge, Skills and Attitude toward the Care of Patients with Stroke. Alexandria Scientific Nursing Journal, 23(2), 10‑21. https://doi.org/10.21608/asalexu.2021.219098

Oroszi, T. (2020). Competency-Based Education. Creative Education, 11, 2467‑2476. https://doi.org/10.4236/CE.2020.1111181

Ramadan, E., Abd El Hady, R., & El Sharkawy, A. (2019). Effect of Training Program on Nurse Intern's Knowledge and Practice Regarding Obstetric and Gynecological Skills at Benha University Hospital. American Journal of Nursing Research, 7(5), 889:898.

Succar, T., McCluskey, P., & Grigg, J. (2017). Enhancing medical student education by implementing a competency-based ophthalmology curriculum. *Asia-Pacific Journal of Ophthalmology*, *6*(1), 59‑63. https://doi.org/10.22608/APO.2016102

Tan, K., Chan, C., Subramaniam, P., & Ping, W. (2018). The effectiveness of outcome based education on the competencies of nursing students: A systematic review. *Nurse Education Today*, *64*, 180‑189. https://doi.org/10.1016/j.nedt.2017.12.030

Valizadeh, S., Mohammadpour, Y., Parvan, K., & Lakdizaji, S. (2009). The Effect of Outcome-Based Education on Nursing Students' Clinical Competency. *Iranian Journal of Medical Education*, *9*(2), 157‑165.

van Griethuijsen, R. A. L. F., Kunst, E. M., van Woerkom, M., Wesselink, R., & Poell, R. F. (2019). Does implementation of competence-based education mediate the impact of team learning on student satisfaction? *Journal of Vocational Education and Training*, 516‑535. https://doi.org/10.1080/13636820.2019.1644364

Vlassoff, M., Abdalla, H. A., & Gor, V. (2020). The Cost to the Health System of Postpartum Hemorrhage in Egypt. Repéré à https://www.guttmacher.org/report/cost-of-postpartum-hemorrhage-in-egypt

Wake, G. E., & Wogie, G. (2020). Assessment of Midwife Knowledge, Practice, and Associated Factors towards Active Management of the Third Stage of Labor at Governmental Health Institutions in Tigray Region, Northern Ethiopia, 2018. *BioMed Research International*, 1‑10. https://doi.org/10.1155/2020/8547040

WHO. (2021). WHO study shows new drug formulation could save thousands of women's lives. Repéré à https://www.who.int/news/item/27-06-2018-who-study-shows-new-drug-formulation-could-save-thousands-of-women-s-lives

Wu, F.-Q., Wang, Y.-L., Wu, Y., & Guo, M. (2014). Application of nursing core competency standard education in the training of nursing undergraduates. *International Journal of Nursing Sciences*, *1*(4), 367‑370. https://doi.org/10.1016/j.ijnss.2014.10.010

Yaekob, R., Shimelis, T., Henok, A., & Lamaro, T. (2015). Assessment Of Knowledge, Attitude, And Practice Of Midwives On Active Management Of Third Stage Of Labour At Selected Health Centers Of Addis Ababa, Ethiopia, 2014, *5*(11). Repéré à www.iiste.org

Yaseen, S., Fatima, S., Ramzan, U., Quasar, R., & Ara, S. (2021). Knowledge and Practice of Active Management of Third Stage of Labour (AMTSL) among Nurses Working in Selected Hospitals of Kashmir. *International Journal of Creative Research Thoughts*, *9*(2), 5232‑5238. https://doi.org/10.24321/2455.9318.201849

Zaker, M., Hosseini, S., & Mohammad-Pour, Y. (2017). The Effect of Competency-Based Education Model on Cognitive and Clinical Skills of Nursing Students. *International Journal of Scientific Study*, *5*(8), 356‑360. https://doi.org/10.17354/ijssNov/2017/51