Effect of Competency Based Training Program on the Nurses' Performance, and Selfconfidence Regarding Antenatal Care

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Abstract

Background: Effective prenatal nursing care is dependent on skilled and confident nurses working in a well-equipped healthcare environment with a reliable referral system. Nurses should advocate for comprehensive supportive care for women and prioritize the implementation of high quality healthcare standards. The aim of this research was to evaluate the effect of competency based training program on the nurses' performance, and self-confidence regarding antenatal care. Research design: A quasi-experimental research design was utilized. Setting; held in four settings; the first two settings were at outpatient clinics of obstetrics and gynecological departments at Tanta University and El- Menshawy hospitals, while the other two settings are at EImbaby Maternal and Child Health and Sigar Medical Centers in Tanta City, Elgharbia Governorate, Egypt. Data were collected using three tools: Tool (I); Nurses' knowledge regarding antenatal care questionnaire was included three parts. Part I: Nurses' socio demographic characteristics; Part II: professional history of studied nurses; and Part III: Assessment of nurses' knowledge regarding antenatal care. Tool (II); Nurses' practical observational checklist regarding antenatal care. Tool (III); Nurses' self-confidence regarding antenatal care. Results: Nurses' knowledge, clinical performance, as well as selfconfidence concerning antenatal care were high after the implementation of competency based training program. Conclusion and recommendations: Competency based program was effective at enhancing the nurses' knowledge and practice concerning antenatal care which translated into higher confidence scores. Hence, this program should be conducted continuously and adopted to enhance and refresh nurses' performance and confidence in other different maternity nursing subjects.

Keywords: Competency based program, Nurses, Performance, Self-Confidence, Antenatal Care

Introduction

Globally, the antenatal period poses a significant risk for both pregnant women and their babies. Research shows that one quarter of maternal deaths occur during this time. While the risks associated with pregnancy cannot be completely avoided. they can be minimized through accessible, effective, and comprehensive maternity healthcare (Amponsah-Tabi et al., 2022). Antenatal health care is a form of preventive health care as well as first contact chance for woman with the formal health services to prevent complications in this critical phase. Through antenatal health care; women can acquire from skilled health nurse the healthy behaviors through pregnancy, well understanding of warning signs throughout pregnancy as well as childbirth (UNICEF, 2024).

World Health Organization (WHO), (2022); defines antenatal health care as "care provided to the pregnant mother before birth", besides compromised the education; screening; counseling; treatment of minor ailment; as well as immunization services. Globally, according to WHO (2023); every year, 303,000 maternal deaths occur as a pregnancy result of and childbirth complications. In Egypt, according to WHO, World Bank and UNDESA\ Population Division (2023); the maternal mortality ratio was calculated to be 17 deaths for every 100,000 live births. Quality of the antenatal care can decreases maternal and perinatal morbidity as well as mortality directly throughout the identification besides management of the pregnancy-associated complications, and indirectly throughout the early identification of those on high risk of evolving pregnancy danger signs besides

prompt referral to suitable care facilities (Penman, Beatson, Walker, Goldfeld, & Molloy, 2023). Antenatal care also provide access to preventive and promotive services in pregnancy which include immunization against tetanus, Intermittent Preventive Treatment screening (IPT), against infections e.g. Human Immunodeficiency detection of Virus (HIV), noncommunicable diseases like hypertension, gestational diabetes, health counseling and education about mothers and child care. Antenatal care visits also provide an opportunity to receive social, emotional and psychological support and family planning (Gebrekirstos, Wube, services Gebremedhin, & Lake, 2021).

Antenatal care contains a lot of components history taking, like detailed physical examination. laboratory work, and diagnostic investigations. The WHO commends that pregnant women should start antenatal care in their first trimester with a complete of eight contact visits. Scheduling prenatal care appointments during the first trimester provides the best opportunity to discuss key aspects of maternity healthcare and strengthen engagement throughout the entire pregnancy period (Abuku, Allotey, & Akonde, 2023).

The World Health Organization (WHO) has praised specific approaches aimed at reducing the maternal mortality rate (MMR). One of these approaches is to support high quality of maternal care services through improving nurses' expertise, abilities, and confidence, as well as hiring skilled and competent nurses (WHO, 2023). Selfconfidence plays a vital role in affecting the timely and effective nursing care provided to patients. Nurses with elevated levels of selfconfidence display increased proficiency in making precise clinical judgments and delivering superior care to their patients. (Abu Sharour et al., 2022).

should receive training Nurses using educational modern methods like competency based education (CBE) (Hakimi, Kheirkhah, Abolghasemi, & Hakimi, 2022). Competency is clearly defined as specific qualities or traits that individuals aim to demonstrate in order to excel in a particular activity. These qualities include work-related behavior (e.g., task completion). motivation (e.g., feelings, and emotions. job satisfaction). and technical knowledge/skills (e.g., professional expertise related to the job). This definition emphasizes that competency is a complex combination of knowledge, performance, skills, values, and attitudes (Tallam, Kaura, & Mash, 2022).

Competency Based Education (CBE) in nursing is a performance-driven approach that focuses on advancing nurses' skills through practice and demonstration. It requires nurses to actively participate in all aspects of patient care to show competence in antenatal health care (Ali, Ali, & Barakat, 2024). Moreover, Nurses can gain crucial monitoring experience through wellorganized programs that enable them to apply their expertise in a professional environment, leading improved to performance and efficiency in healthcare organizations. Consequently, nurses need thorough education and training on ensuring women's safety and health. CBE prioritizes nurses' capacity to achieve specific learning objectives (Chen, Zhang, & Li, 2022).

In CBE, nurses are encouraged to be involved in critical thinking, strong

communication skills, and collaborative problem-solving. This approach differs from the traditional method that relies on timebased training and the completion of academic degrees (Ige, Ngcobo, & Afolabi, 2023). Nurses are important members of antenatal health care teams; can aid pregnant women in order to avoid and identify common health problems accompanying with pregnancy, as well as they can instill healthy habits throughout pregnancy. The nurses' effort with parents through gestational period; can teach breastfeeding techniques, suggests some parenting skills and keeping their fetus healthy before, during and after birth is a vital part with the support of a medical nurse (Spiby, Stewart, Watts, Hughes, & Slade, 2022; Franjic, 2022).

Significance of the study

Ensuring that maternal mortality drops to less than 70 per 100,000 live births by 2030 is a key focus of the third sustainable development goal, which aims to improve overall health and well-being (Mahada, Tshitangano, & Mudau, 2023). WHO strategies for Ending Preventable Maternal Deaths (EPMM) highlight the importance of providing high-quality care through trained nurses, which can be achieved through continuous education and training (United Nations International Children's Emergency Fund, 2023). The current perinatal mortality rate in 2022 is 15.084 deaths/1000 live births, while in Egypt, perinatal mortality rate in 2022 is 15.513 deaths/1000 live births, and this number can be reduced through reduction of MMR by improving performance of antenatal nurses (United Nations Interagency Group for Child Mortality Estimation, 2022).

Although, CBE is very crucial for maintaining high standard for maternal and neonatal morbidity as well as mortality reduction (**Tallam et al., 2022**), still few researches were conducted on this topic. Thus, the purpose of this research is to measure the effect of competency based program on nurses' performance and confidence level regarding antenatal care.

Research Aim

This research aimed to evaluate the effect of competency based training program on the nurses' performance, and self-confidence regarding antenatal care.

Research Hypothesis

- Hypothesis (I): Nurses' performance expected to be enhanced after the implementation of the competency based training program regarding antenatal care.
- Hypothesis (II): The implementation of the competency based training program regarding antenatal care expected to result in significant improvement in nurses' selfconfidence.

Operational definitions:

- Nurses' Performance: measured through assessing nurses' level of knowledge and clinical practical skills.
- Self-Confidence: is abstractly well-defined as believing the soundness of one's own judgment as well as performance. By meaning; confidence is thinking of the ability to do a task, while the competence doing a task (Marshall, 2020).

Research Subjects and Method:

Research design:

A quasi-experimental design was used to meet the aim of this present research.

Research Settings

The research study was held in four settings in Tanta city, El-Gharbia Governorate;

- The first two settings were at outpatient clinics of obstetrics and gynecological department:
 - 1. **Tanta University Hospital**; affiliated to the Ministry of High Education and Scientific Research).
 - 2. **El-Menshawy General Hospital;** Affiliated to the Ministry of Health and Population.

The **other two settings** were at the Maternal and Child Health Centers (MCH), which are affiliated to the Ministry of Health:

- 3. El-Imbaby MCH Center.
- 4. Siger Medical Center.

Research Subjects

All nurses who worked in the previously mentioned settings (80 nurses). Those nurses were included in this study for giving the initial antenatal visit for pregnant women in the previously stated research settings. They divided as following:

1- Nurses who were working at the outpatient clinic of obstetrics and gynecological department, **Tanta University Hospital**; (5).

2- Nurses who were working at the outpatient clinic of the obstetrics and gynecological department of **El-menshawy** General Hospital; (30).

3- Nurses who were working at the El-Imbaby MCH center; (20).

4- Nurses who were working at the Sigar Medical Center; (25).

The **criterions** used for the **calculation of sample size** were as subsequent;

-95% of confidence level.

-5% margine of error.

Tools of the collected data

In order to attain the aim of the **research**; **three tools** were utilized:

Tool (I); Nurses' knowledge regarding antenatal care questionnaire: was developed by investigators after revising the related literatures (Sabry, Mansour & Khedr, 2017; & Cunningham et al., 2022) to collect the needed data. It was consisted of the subsequent three parts:

Part I: Nurses' socio demographic characteristics were utilized to assemble nurses' basic data as; age, marital status, residence, income, as well as educational level.

Part II: Professional History of the Studied Nurses was used to assess nurses' basic professional history, which was included the following items; experience years, place of work, previous participation in competency based training program regarding antenatal care, and availability of educational aids regarding antenatal care in the work place.

Part III: Assessment of nurses' knowledge regarding antenatal care was utilized to evaluate nurses' knowledge regards antenatal care. It compromised of 10 open end questions regarding definition, objectives, components of the antenatal care, positive signs of the pregnancy, key components of the antenatal healtheducation, components for women's selfcare measures, danger signs of pregnancy, and the recommended follow-up visits schedule.

Scoring system for nurses' knowledge regarding antenatal care was established and classified by investigators as following:-

- The correct complete answers were scored (1).
- The incorrect answers/don't know were scored (0).

The overall score of nurses' knowledge (44 grades) level adapted by the investigators from (Ali, Bedier, Salem, Ahmed, & Elhfnawy, 2021) that built on Benners' competency stages (Benner, 2001) by way of the following:

	U	
Level of	Categor	Total scores
competenc	У	
У		
Expert	Excellen	≥90%
	t	(40-44 grades)
Proficient	Very	80 to 89%
	good	(36-39 grades)
Competent	Good	70 to 79%
		(31- 35 grades)
Advanced	Fair	60 to 69%
beginner		(26-30 grades)
Novice	Fail	< 60%
		(0-25 grades)

Tool (II); Nurses' practical observational checklist regarding antenatal care: This tool established by investigators guided by (Sabry et al., 2017; WHO, 2022 & USAID American people, 2023) to assess nurses' practice of antenatal care before, immediate post and one month later competency based training program. The checklist contained steps/tasks in the order required to implement wholly skills being trained in standardized manner. It was comprised **nurses' practices regarding antenatal care** as following (9 Domains):

- **1.** Antenatal booking and good communication skills (7 items).
- 2. History taking skills (47 items).
- **3.** Application of infection control measures skills (6 items).
- **4.** Application of women's general examination skills (11 items).
- **5.** Application of women's local abdominal examination skills (5 items)
- 6. Supervision/performing recommended women's laboratory investigations skills (7 items).
- 7. Identification of pregnancy related complications skills (11 items).

- **8.** Providing of antenatal health education skills (15 items).
- **9.** Evaluation and documentation skills (1 items).

The Scoring system for nurses' practices regarding antenatal care categorized as subsequent:

- The correct done was scored as (1).
- The incorrect done/not done was scored as (0).
- Score for the referral item in the evaluation and documentation skills wasn't included in the total score as there weren't complicated cases for referral, so the total score of **evaluation and documentation** skills was **one grade only.**
- The total score of observational practice of initial antenatal care ranged from (0-110) which high score indicated high level of practice.

The total Nurses' practical competency level was adapted by the investigators from Ali et al (2021) that built on Benners'

Level of	Category	Total scores
competency		
Expert	Excellent	≥90%
		(99-110
		grades)
Proficient	Very	80 to 89%
	good	(88-98grades)
Competent	Good	70 to 79%
		(77-87grades
Advanced	Fair	60 to 69%
beginner		(66-76grades)
Novice	Fail	< 60%
		(less than
		66grades)

competency stages (Benner, 2001) by way of the following:

Tool **(III):** Nurses' self-confidence regarding antenatal care: This tool was established by investigators based on standardized competencies for antenatal health care (Sharma, 2014; Sabry et al., 2017; WHO, 2022 & USAID American people, 2023). It included 24 skills statements for antenatal care. Nurse's Confidence level was assessed on 4-point Likert scale with: **not confident** (1); somewhat confident (2); confident (3); and very confident (4). The question on confidence for each skill statement read by means of "How confident are you to perform this skill independently?

Subscalesforantenatalcare:Ninedomainsof the antenatal carewith 24 itemswhich were labeled as follows;

- Antenatal booking and good communication skills (2 items)
- History taking skills (5 items)
- Infection control measures (3items).
- Women's general examination (4 items).
- Women's local abdominal examination (4 items)
- Women's laboratory investigations (2 items).
- Pregnancy related complications (1item).
- Antenatal health education (1 item).
- Evaluation and documentation skills (2 items).

Scoring system: the response for each item ranged from 1 to 4 grades, while the total score for all items of confidence level ranged from 24-96 grades, with high value indicate high confidence level. Total score regarding nurses' confidence level: confidence responses for every subscale were summed up to form a percent as the follow:

 High confidence: ≥75% of the total score (72-96 grades) Low confidence: < 75% of the total score (24- 71 grades) Method

1. Administrative phase;

An official approval was received from the dean of Faculty of Nursing, Tanta University before carrying out this research through an approval letter acceded to the administrators of previously mentioned research settings to get their agreement and collaboration for conducting the research.

2. The ethical considerations;

An ethical agreement from Scientific Research Ethical Committee, Faculty of Nursing, Tanta University, was achieved with ethical research code (**Approval Code: 269-6-2023**). Additionally, the researchers ensured that the nature of the research do not evoke any harm/pain for all-inclusive sample. Moreover, maintaining privacy; confidentiality of data that collected; the ability of the studied nurses to participate or withdraw from the research at any moment.

Tools of the data Collections;

- Tools for the collected data: Tool (I) Tool (II) as well as Tool (III) were established by investigators after reviewing the related literatures as aforementioned.
- Validity and reliability of the research tools: the validity of the research tools were assessed through a jury test conducted by four specialists in field of maternal and neonatal in addition to community health nursing. This evaluation anticipated to regulate the relevance and appropriateness of the entire tool in measuring the desired outcomes. The questionnaire's validity was determined to be > 95% based on expert opinions. As regard to reliability, the questionnaire was tested among pilot subjects, and Cronbach's Alpha coefficients were calculated. The values obtained were 874 concerning Tool (I); 929 concerning

Tool (II); as well as 974 concerning Tool (III).

3. The pilot study;

Previous to actual data collection, a pilot study was accomplished on 10% of the entire sample (eight nurses) from aforementioned settings. This pilot study targeted to check the feasibility as well as applicability of the research tools. Data collected from pilot study and subjects were involved in the final entire research sample as never significant critical changes or modifications were made to the tools.

4. The data collection;

- The data collection period for this research study lasted for six months; starting in July 2023 and ending in December 2023. The researchers visited the specified research locations three days a week until they reached the desired sample size.
- **Educational program Development;** the process of this research study involved four phases (assessment; planning; implementation; as well as evaluation phase).

Phase I: The assessment phase:

The investigators introduced themselves, greeted every nurse, interviewed with every nurse individually and collected nurses' basic socio-demographic data and nurses' knowledge regarding antenatal care using **tool (I)**. This took about 10 minutes. The investigators also assessed nurses' practice regarding antenatal care using **tool (II)** in around 45 minutes. Moreover, nurses' self-confidence regarding antenatal care was assessed using **tool (III)** nearby 15 minutes for each nurse.

Phase II: The planning phase:

a. The preparation of training-program sessions;

Competency based training program was established by investigators centered on the findings from the phase I (assessment phase) in addition the relevant literatures. The educational program was encompassed three sessions for every group. 80 nurses of the entire sample size were evenly allocated into 12 groups; One group (5 nurses) in Main Tanta University Hospital; while, four groups in El- Menshawy General Hospital (two groups consisted of 8 nurses and two groups included 7 nurses); as well as three groups in El-Imbaby MCH center (two group consisted of 7 nurses and one group included 6 nurses). In addition, four groups at Sigar Medical Center (three groups compromised of 6 nurses and one group contained 7 nurses). The investigators spent three days a week and took from 30 - 45 minutes for completing each session.

b. Program goals and objectives;

-The program goal was to heighten nurses' performance as well as self-confidence regarding antenatal care.

-The program objectives; after the implementation of educational program, studied nurses will be capable to:

- Determine the definition of antenatal care.
- Estimate the expected date of the delivery (EDD) and gestational age (GA).
- Classify the schedule of the antenatal visits as well as categorize the information typically collected at the initial and followup antenatal visits.
- Demonstrate general and local abdominal examination during pregnancy.
- Illustrate the key components of antenatal education.
- Choose appropriate professional attitudes and behaviors in different situations.
- c. Teaching methods and materials;

- A health educational-booklet was established by investigators centered on nurses'performance and confidence.
- The investigators used simple teaching methods such as lecture, demonstration, discussion and media as power point presentation and handouts regarding antenatal care.

Phase III: Field work phase:

- The investigators clarified the aim of training program for entirely nurses, and then achieved their consent in order to engage in the research. The training program was divided into 3 sessions for every group. The sessions were as subsequent;
- First session; its aim was to supply nurses with knowledge regarding the definition, objectives, components of the antenatal care, positive signs of the pregnancy, key components of the antenatal health-education, components for women's self- care measures, danger signs of pregnancy, and the recommended follow-up visit schedule.
- Second and Third sessions; their aims were to supply the entirely nurses with the accurate and required practical skills regard antenatal care including; antenatal booking registration; application of good and communication skills; application of antenatal assessment; application of infection control measures; providing of antenatal health education; in addition to evaluation and documentation.

Phase IV: Program evaluation phase:

-Nurses' performance as well as selfconfidence regarding antenatal care were assessed three times; before and immediately post in addition to follow up with one month after the implementation of the training program for every studied nurse through using of Tool (I); part two, Tool (II) and Tool (III). -Finally, the gathered data was consolidated and statistically examined with proper tests. Then appraisal was completed between the three times; before, and immediately in addition to one month after the implementation of training program in order to ascertain the influence of competency based training program on the nurses' performance, as well as self-confidence regarding antenatal care.

Results

Table 1: showed that the nurses' age extended from 20-56 years with a mean and SD of 35.08 ± 11.64 , as well as 45% of them whose age extended from 20- fewer than 30 years old. Slightly less than three quarters (73.8%) of the studied nurses were married compared to 26.2% of them were single. Slightly more than half (55%) of the studied nurses came from rural area, while 63.8% of them hadn't enough income and had diploma in nursing technician.

Table 2: Displayed that the years of experience extended from 3-35 years with a mean & SD of 15.26±7.44. 37.5%, 31.2% and 25% of the studied nurses worked in the outpatient clinic of the obstetrics & gynecological department, El-Menshawy hospital; Sigar Medical Center; and Elmbaby MCH Center respectively. 60% of the studied nurses reported that they didn't participate in competency based training program regarding antenatal care while, 58.8% of them reported availability of an educational aids regarding antenatal care in their work place. 68.1% of the educational aids about antenatal care in the work place were in the form of booklets followed by posters (38.3%).

Table 3: found that around two thirds(66.3%) of the nurses had novice level ofcompetency regard knowledge of the

antenatal care compared with 21.3% and 12.4% had advance beginner and competent respectively before level program. Immediately post as well as one month after program application, the table showed that 52.4% and 46.2% had proficient level of competency knowledge respectively compared to 33.8% and 23.8% had expert level knowledge of competency respectively. The total knowledge mean scores were 20.1±6.7 before and improved to be 37.3 ± 3.2 and 36.3 ± 3.3 immediately post as well as one month after respectively. There was statistically significant improvement in the total mean knowledge scores from before to one month after of program (p < 0.05).

Table 4: Reported that there was a statistically significance difference in mean scores of total practice domains before competency program to one month later program (p<0.05) except two items regarding booking and communication as well as evaluation and documentation, there was a statistical significance difference in mean score regarding item for booking & communication before, one month after and before, immediately posttest only (p < 0.05). statistically significance There was a difference in mean score regarding the item documentation for evaluation & immediately post as well as one month later the program application only (p < 0.05). The great improvements was seen for the mean score of the domain of history taking, as it was 28.28±8.30 before program and improved to 41.67±3.5 and 39.56±3.99 immediately post as well as one month after respectively.

Table 5: About two fifths (41.2%) of theentirely nurses had novice as well as

advanced beginner level of competency regarding practice of antenatal care compared with 16.3% and 1.3% had competent and proficient level respectively. Immediately and one month later program application, the table showed 56.3% and 61.3.2% had proficient level of practice respectively compared to 37.4% and 16.3% had expert level of practice respectively. The total practice mean scores was 65.06±17.10 before and improved to be 96.67±5.71 and 92.66± 6.06 immediately post as well as one month later program application respectively with statistically improvement in the total mean practical scores pre assessment till one month after of the competency program (p < 0.05). Figure 1: presented that before implementation of competency program, slightly further than half (55%) of the nurses had high confidence score compared with 45% had low confidence score. Immediately post as well as one month later competency program, 93.8% and 90% of the entirely nurses had high confidence level compared with 6.2% and 10% had low level of confidence respectively.

Table 6: Illustrated a positive correlation between total nurses, knowledge score as well as total practice score throughout the whole phases of the study (p < 0.05) before, immediately post and one month after respectively. In contrast, the was no statistical significance correlation between total knowledge score as well as total confidence score also between total practice score as well as total confidence score before to one month later program application (p>0.05).

The studied Nurses(n=80)						
Socio-demographic characteristics	Ν	%				
of entirely studied nurses						
Nurses' Age in years						
a) 20:<30	36	45				
b) 30:<40	20	25				
c) 40:<50	11	13.8				
d) 50:<60	13	16.2				
Range: 20-56						
Mean ±SD: 35.08±11.64						
2- Marital status						
a- Single	21	26.2				
b- Married	59	73.8				
c- Divorced	0	0.0				
d- Widow	0	0.0				
3- Residence	·					
a- Rural	44	55				
b- Urban	36	45				
4- Income	·					
a- Enough	17	21.2				
b- Not Enough	51	63.8				
c- Enough & save	12	15				
5- Educational Level						
a- Diploma in nursing technician	51	63.8				
b- Nursing technical institute	19	23.7				
c- Bachelor of nursing	10	12.5				

Table 1: Percent distribution of the nurses according to their socio-
demographic characteristics:

The entirely studied nurses (n=80)					
Professional History of the entirely studied nurses	n	%			
Experience (years)					
a- <10	35	43.8			
b- 10: <20	24	30			
c- 20: <30	11	13.8			
d- 30 &more	10	12.4			
Range: 3-35					
Mean & SD: 15.26±7.44					
2- Place of work					
a. EImbaby Maternal & Child Health Center	20	25.			
b. Sigar Medical Center	25	31.2			
c. Outpatient clinic of the obstetrics & gynecological department, Tanta	5	63			
University hospital	5	0.5			
d. Outpatient clinic of the obstetrics & gynecological department, El-	30	37.5			
Menshawy hospital					
3- Previous participation in competency based training program regardin	g antenata	l care			
a-Yes	32	40			
b- No	48	60			
4- Availability of an educational aids regarding antenatal care	1	1			
a- Yes	47	58.8			
b- No	33	41.2			
5- * If yes , Mention Type of it					
a- Posters	18	38.3			
b- Booklets	32	68.1			
c- Brochures	11	23.4			

 Table 2: The percentage distribution of nurses according to their professional history;

* More than one answer is selected

Nurses (n=80)									
Nurses' total knowledge	Before	e	Imm	ediatel	One	month			
Scores			y-pos	st	after				
	Ν	%	N	%	Ν	%	Z value	P-value	
• Novice (< 60%) (0-25)	53	66.3	0	0.0	0	0.0	P1=7.781	0.0001*	
 Advanced beginner 	17	21.3	4	5	1	1.2	P2= 7.72	0.0001*	
(60% to 69%) (26-30							P3= 3.168	0.002*	
grades)									
• Competent (70% to	10	12.4	7	8.8	23	28.8			
79%) (31- 35 grades)									
 Proficient (80% to 	0	0.0	42	52.4	37	46.2			
89%) (36-39 grades)									
■ Expert (≥ 90%) (40-	0	0.0	27	33.8	19	23.8			
44 grades)									
Total Nurses' total knowledge Scores (0- 44 grades)									
Range	6-35		28-42	2	27-43				
Mean & SD	20.1±6	5.7	37.3±	-3.2	36.3±3	3.3			

Table 3: The percentage distribution of the nurses based on their total knowledge scores:

*Statistically Significant (p < 0.05) Z 2= before &immediately posttest Z1= before & one month after

t **Z 3**= immediately post & one month after

Z Test: Wilcoxon Signed Ranks Test

Table 4: Mean as well as standard	deviation of the e	entirely nurses	pertaining t	o competency
practice domains:				

Total Studied Nurses (n=80)											
Competency Practice	Before	Immediately-post	One month	Z value	P-value						
Domains	Range	Range	Range								
	Mean ± SD	Mean ± SD	Mean ± SD								
Booking &	0-7	2-7	3-7	$Z_1 = 6.864$	P1=0.0001*						
Communication	3.95±2.11	5.90±1.27	5.86±1.04	Z ₂ =7.173	P2=0.0001*						
				Z3=1.319	P3=0.187						
History Taking	1-44	30-47	28-47	$Z_1 = 7.686$	P1=0.0001*						
	28.28±8.30	41.67±3.5	39.56±3.99	$Z_2 = 7.777$	P2=0.0001*						
				Z ₃ =5.91	P3=0.0001*						
Infection control	0-6	3-6	2-6	$Z_1 = 6.289$	P1=0.0001*						
	3.17±1.84	5.20±0.66	4.97±0.99	$Z_2 = 6.899$	P2=0.0001*						
				$Z_3 = 2.272$	P3=0.023*						
General Examination	0-9	4-11	6-11	$Z_1 = 7.762$	P1=0.0001*						
	5.5±2.46	9.18±1.29	8.87±1.03	$Z_2 = 7.831$	P2=0.0001*						
				$Z_3 = 3.404$	P3=0.001*						
Abdominal Examination	0-5	4-5	2-5	Z1=5.609	P1=0.0001*						
	3.15 ± 1.56	4.48±0.54	4.28±0.69	Z2=6.324	P2=0.0001*						
				Z3=3.024	P3= 0.002*						
Laboratory Examination	0-7	4-7	4-7	Z1=5.057	$P_1=0.0001*$						
	4.82±1.81	6.38±0.98	6.16±0.96	Z2=5.975	$P_2=0.0001*$						
				Z3=2.636	P ₃ =0.008*						
pregnancy related	0-11	8-11	8-11	Z1=7.372	P ₁ =0.0001*						
complications	6.97±2.41	9.68±0.98	9.36±0.81	Z2= 7.361	P ₂ =0.0001*						
				Z3=4.218	P ₃ =0.0001*						
Health Education	0-15	12-15	10-15	Z1=7.446	$P_1 = 0.0001*$						
	8.38±3.06	13.12±0.89	12.71±1.25	Z2=7.708	P ₂ =0.0001*						
	<u> </u>	0.1	<u> </u>	Z3=3.771	$P_3=0.0001*$						
Evaluation &	0-1	0-1	0-1	Z1 = 0.243	$P_1 = 0.80$						
Documentation	0.812 ± 0.32	0.90±0.30	0.82 ± 0.38	Z2=1.698	$P_2=0090$						
			1	Z3=2.449	$P_3=0014*$						

vcf*Statistically Significant (p < 0.05) Z1= before & one month after

Z 2= before &immediately post -test

Z 3= immediately post & one month after

Z Test: Wilcoxon Signed Ranks Test

Total Entirely Nurses (n=80)									
Nurses' Total Practice	Before		Immed	liately-	One	month			
Scores			post		after				
	Ν	%	n	%	n	%	Z value	P-value	
• Novice (< 60%)	33	41.2	0	0.0	0	0.0	Z1=9.98	0.0001*	
(<66grades)							Z2= -8.77	0.0001*	
 Advanced beginner (60%) 	33	41.2	0	0.0	0	0.0	Z3= 6.28	0.0001*	
to 69%) (66-76grades)									
• Competent (70% to 79%)	13	16.3	5	6.3	18	22.5			
(77-87grades)									
 Proficient (80% to 89%) 	1	1.3	45	56.3	49	61.3			
(88-98grades)									
• Expert (\geq 90%) (99-110	0	0.0	30	37.4	13	16.2			
grades)									
Total Nurses' Practice Scores	(1- 110 g	rades)							
Range	5-92		82-110		77-110				
Mean & SD	65.06±17.10		96.67±5.71		92.66± 6.06				
*Statistically Significant (p < 0	0.05)	Z	1= befor	e & one	month at	fter Z	2 = before &		

Table 5:	The percentage	distribution	of	the	nurses	relating	to	their	total	practice	scores
	regards antenata	l care									

Statistically Significant (p < 0.05)</th>Z1= before & one month afterZ 2= before &immediately post -testZ 3= immediately post & one month afterZTest: Wilcoxon Signed Ranks TestZ



Figure (1): Nurses' percentage distribution based on total confidence scores before, immediately post and one month later;

 Table 6: Correlation between total nurses' knowledge scores, observational practice scores, and total confidence scores;

Time		Total		Total p	oractice	Total confidence	
		knowled	lge	scores		scores	
		scores					
		r	Р	r	Р	r	Р
Before	Total knowledge			0.304**	0.006	-0.034	0.766
	scores		-				
	Total practice scores	0.304**	0.006			-0.013	0.908
					-		
Immediately-post	Total knowledge			0.357**	0001	-0.067	0.552
	scores		-				
	Total practice scores	0.	0001			-0.026	0.819
		357**			-		
One month after	Total knowledge			0.361**	0001	-0.106	0.350
	scores		-				
	Total practice scores	0.	0.001			-0.152	0.350
		361**					

****** Correlation is significant at the 0.01 level (tailed).

Discussion

The third aim of the 2030 sustainable development goals is to achieve health and well-being for all, with a focus on reducing maternal mortality. Strategies for EPMM aim to reduce disparities in access and quality of health care across countries (World Health organization, 2023). CBE is an emerging trend in nursing education which permits nurses to progress besides master skills at their field through concentrating on their performance as well as capabilities. A competent nurse plays critical role in maternity health care and can autonomously manage the care of healthy newborns as well as mothers through child-bearing cvcle. Consequently, the expansion of the clinical skilled nurse is precarious as this can donate to their proficient caring skills in addition to reflect positively on well-being and health (El-afandy & Ahmed, 2023). In view of the preceding outline; researchers carried out this research to evaluate the effect of competency based program on nurses' level of performance and confidence level regarding antenatal care.

The present research exposed that around two thirds of the entirely nurses had novice competency level compared with about one fifth and nearly one eighth had advance beginner and competent level regarding knowledge of antenatal care respectively. This might be as a result of presence of further than half of the entirely nurses didn't participate in any workshop about antenatal care. Low socio-economic factor and low educational level of nurses are other factors of low level of knowledge, as about two thirds of them hadn't enough income and had only diploma in nursing. However. Immediately post as well as one month later implementing research study; it was found that slightly more than half and further than one third of nurses had proficient knowledge level respectively compared to around one third and one quarter of them had expert level of knowledge respectively with statistical significance difference in total mean knowledge score. This means that competency program helped nurses' positively to increase from novice or advance beginner level before program to proficient and expert level of knowledge immediately post as well as one month later program application. These findings were supported with Naga, Bedier, Salem, Ahmed, & Elhfnawy, (2021) who revealed highly statistical significance enhancements in their knowledge through the research with all phases of competency program application. This is in harmony with a research completed by Muzeya & Julie, measured (2020). Thev student midwives' knowledge, skills as well as competency in relative to active management of 3rd stage of labor; they reported significant increases in total mean of knowledge regard the active management of third stage of labor later program implementation.

Similarly, a study done by Hakimi, Kheirkhah, Abolghasemi, Hakimi, & Farshad, (2019) to determine the impact of competency based education on Iranian midwifery students centered on the Kirkpatrick evaluation model. They warranted that knowledge scores among study group amplified significantly during immediate as well as follow-up test evaluations than students among control group.

Poor quality of care delivered to pregnant women is considered one of the crucial causes and predisposing factors of high maternal death and diseases. Hence, there is requisite for nurses to attain and preserve a set of competences/skills that permit them to provide safe maternity care according to standards (WHO, global 2023). Pertaining to nurses' practice level on antenatal competence standards; the current research showed that prior of implantation competency intervention, about two fifths from studied nurses had novice and advanced beginner of practice compared with about one fifth of them had competent practice This revealed the lack of use of competency-based practice as a key component of quality assessment programs in maternity care services. However, immediately post as well as one month later program application; further than half from the entirely nurses had proficient practice level compared with further than one third and about one fifth of them had expert level of practice respectively. The total practice mean scores were improved statistically before program till one month after. This indicates the positive efficiency of program on the nurses' practice. The finding of this research was reinforced by Osman, El Ansary, Mohamady, (2023).Thev found noticeable enhancement occurred in the total score of practice immediately post intervention, as well as follow-up evaluations when measured nursing students' performance regard active management of the 3rd stage of labor following competency program. Also, study made by Gholamian, Alidoosti, Zolala, & Sabzevari, (2022) reported a significant improvement in clinical skills among midwifery students trained using the CBE compared to trained using Conventional those Teaching Methods (CTM). Similarly, a study done by Kimario & Otieno, (2022), which declared the important of curriculum competency based for self-employment, application innovation, besides the acquisition of several competencies for sustainable development. On the same context, a study done by Moon and Cho, (2022), they found that the competency-based triage education application was active in enlightening the nurses' emergency triage competency in addition to performance.

Self-confidence is powerful а component that influences quick, appropriate, safe, and correct nursing interventions. Nurses with higher levels of self-confidence demonstrate greater competence in devising suitable and intervention; making correct safe decision; as well as providing patients with a higher quality of care. (Abu Sharour et al., 2022). As regard nurses' level of confidence, the present research hypothesis was that application of competency program will heighten nurses' confidence level. This hypothesis is authenticated by the research findings which displayed a progressive influence of competency program in heightening nurses' confidence level as there was slightly less than half from entire nurses had low confidence score as pre assessment. However, following the competency training immediately, almost all of them demonstrated a high confidence score with statistically improvement in the

total confidence mean with in all phases of the study.

According to the researcher, this increase in nurses' confidence might be attributed to an increase in nurses' knowledge, abilities, and efficacy of the competency-based program as they grew more conscious of their role in providing prenatal care. This result is in compliance with Boucetta, El Alaoui, Seghir, Ghariz, & Boubih, (2023). They demonstrated that, the critical analysis for competency-based training in nursing as well as midwifery education has its role for enhancing students' practical skills, build their selfconfidence, in addition advance the of maternal quality health-care. Furthermore, Gottlieb, Chan, Zaver, & Ellaway, (2022) who studied the confidence-competence alliance besides the role of self-confidence in medical education, and reported that positive effect of competency on self-confidence from pre-program to post-program application. Also, a longitudinal study conducted via Back & Karlstrom, (2020) revealed that midwifery students trained using the competency based training expressed greater confidence in their clinical skills throughout their training journey.

In relation to association between antenatal knowledge and practice, outcomes of the existing research, found a positive correlation amongst total nurses knowledge score as well as total practice score throughout whole phases of the study. From the researchers' point of view, the enhancement made in the theoretical competency for antenatal care could play imperative role in improvement for the antenatal healthcare skills. This research finding aligned by Bashir, Ansari, & Sultana, (2023); when they investigated the knowledge, attitude, and practice of prenatal care among pregnant women its relationship with socioand demographic characteristics, they discovered that the level of over-all knowledge had a positive correlation with antenatal care practices. Also, Takon, Mgbekem, Madubuko, Ushie, (2023) instituted positive association amongst knowledge as well as practice among the birth attendants regarding antenatal care in the south river state, finding Nigeria. This contradicts Yaseen, Fatima, Ramzan, Ouasar, & Ara, (2021), who investigated nurses' knowledge as well as practices regard active care of 3rd-stage labor in definite Kashmir hospitals. They decided that there was no relationship between them in the study group.

Regarding the correlation among total knowledge score; total practice score; and confidence level, present research found statistical significance no association among total knowledge scores as well as total confidence scores also among total practice scores as well as total confidence scores prior to one month later program application. This could be explained by investigators believes that self-confidence is a subjective and acquired element that can be influenced by several aspects, including role, sense of self, perspective, sense of efficacy, self-esteem, and experiences related to the context or environment. Also, improvement of knowledge and practice may need long time to make improvement in the confidence level so nearby was no correlation among knowledge; practice;

as well as confidence in this research (Lindgren et al., 2021).

The study findings were along the lines of a study made by Esan et al., (2019); that birth attendants' reported knowledge related to most of the maternal and child health interventions wasn't significantly linked to their selfreported confidence in the requisites competencies. This result was on contrary to a study made by Peinado-Molina, Martínez-Vázquez, Paulano-Martínez, Hernández-Martínez, & They Martínez-Galiano (2023). reported a strong relation and association amongst knowledge, selfconfidence as well as satisfaction among nursing students regarding antenatal care.

Additionally, a study made by Tallam et al., (2022) who found positive relation amongst midwives' selfconfidence perceived their and knowledge as well as skills. This discrepancy among the existing research and later literatures might be allied with sample inclusion criteria differences, the study setting and the intervention strategies.

Conclusion

This research exhibited that competency based program was effective in enhancing the nurses' knowledge as well as practice concerning antenatal care that was translated into advanced confidence score. The research results and outcomes meet the aim and hypotheses of this study.

Research limitations

-Phase III (program implementation phase) was prejudiced by both the nurses' absenteeism from the planned training sessions as well as it was affected by disruption and noise. Consequently, the investigators devoted more time and effort for restating the training sessions several times.

Recommendations

-Continuous competency based program and workshop would be carried out for nurses to advance and refresh their knowledge; practice; as well as confidence regard antenatal care.

-Competency Based Education (CBE) would be espoused to boost nurses' performance in additional diverse maternity nursing focuses.

Further researches

-Analysis of aspects influencing nurses' competencies as well as confidence levels including self-efficacy; communication skills; work place safety, socio- economic status and motivation attainment.

-A longitudinal/follow-up research to evaluate nurses' growth from graduation to newly qualified status in terms of competences.

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