Effect of Educational Program on Nurses' Performance regarding Obstetrical Emergencies during Pregnancy

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Abstract

Background: Obstetrical emergencies are stressful events that need to be identified and managed by the health care providers to ensure the best possible clinical outcomes. Therefore, there is a critical need to improve nurses' performance regarding obstetrical emergencies during pregnancy. **Aim:** The current study aimed to determine the effect of educational program on nurses' performance regarding obstetrical emergencies during pregnancy. **Subjects and Method:** A quasi-experimental research design was used. Three hospitals were used for this study: Tanta University (Main Hospital), El-Menshawy, and EL-Mabara Hospital. The study was conducted at the obstetrics departments' antenatal units. This study included all available nurses (50 nurses) at the previously mentioned settings. **Study tools: Tool one:** Nurses' Knowledge regarding Obstetrical Emergencies during Pregnancy and **Tool two:** Nurses' Practices Observational Checklist. **Results**: The results revealed a highly statistically significant improvement of nurses' performance regarding obstetrical emergencies during pregnancy immediately and three months' following the educational program implementation (p=0.000). **Conclusion:** The educational program regarding obstetrical emergencies during pregnancy was effective to enhance nurses′ performance. **Recommendations:** The study suggested creating ongoing training courses to improve and freshen nurses' abilities to handle obstetrical emergencies.

Keywords: Educational Program, Nurses′ Performance, Obstetrical emergencies during pregnancy

Introduction

Obstetrical emergencies are potentially fatal conditions arise throughout pregnancy, childbirth or postnatal and require urgent medical interventions. Most obstetrical emergency cases arise during pregnancy; so, pregnant women are considered a vulnerable group who need special attention and care from nurses and other health care providers for prompt identification and management of obstetrical emergencies during pregnancy **(Leta et al., 2022).** Using of various interventions can reduce the rate of maternal and neonatal deaths as a result of obstetrical emergencies during pregnancy such as improvement of health care services through conduction of reproductive and child health programs **(Mahada et al., 2023).** These programs should be offered to pregnant women and medical professionals especially nurses, in order to increase their self-confidence, and promote early recognition of any complications associated with pregnancy such as, vaginal bleeding, severe pre-eclampsia, eclampsia as well as premature rupture of membranes **(Leta et al., 2022).**

Safe motherhood programs have broad items and the most crucial items of it is the emergency obstetric care. Its categorized as basic and comprehensive care delivered to pregnant women at the time of admission such as initial treatment and nursing care **(Zewde, 2022 & Das et al., 2023).** A nurse's role should include providing basic prenatal care and create awareness among women as well as their families about the danger signs during pregnancy and the significance of prompt, necessary, as well adequate emergency obstetric care. So, providing nurses with educational program regarding obstetrical emergencies during pregnancy is essential to enhance their competency and certify from providing safe and competent care to the women. **(Nkhwalume et al., 2021 & Mukuru et al., 2021).**

Significance of the study

Worldwide, daily, almost 830 women lose their lives from pregnancy and childbirth avoidable causes. In 2015, the rate of maternal death in developing countries is very high which represent 239 per 100,000 live births, compared to their rate in the developed countries which represents 12 per 100,000. The Sustainable Development Goals aim to diminish the global maternal mortality ratio down to less than 70 per 100,000 live births by 2030. **(Samuel et al., 2021, World Health Organization, 2016& United Nations International Children's Emergency Fund, 2023).** The role of the nurse is very vital for offering efficient care to pregnant women in routine and emergency conditions (Spiby et al., 2022). So nurses must have up to date knowledge and enhance their practices regarding obstetrical emergencies during pregnancy. Few researches were conducted on this topic; Thus, it becomes an increasingly vital to evaluate the effect of educational program on nurses' performance regarding obstetrical emergencies during pregnancy to minimize maternal and neonatal morbidity and mortality rate.

Aim of the Study: This study aimed to evaluate the effect of educational program on nurses' performance regarding obstetrical emergencies during pregnancy.

Research Hypothesis: Nurses' performance is anticipated to be improved after the educational program implementation regarding obstetrical emergencies during pregnancy.

Subjects and Method:

Research design: A quasi-experimental study design was used to conduct this study.

Setting: This study was conducted at the antenatal units of obstetrics departments of Tanta University Hospital (Main hospital) affiliated to Ministry of High Education, El-Menshawy Hospital affiliated to Ministry of Health and Population and EL-Mabara Hospital affiliated to Health Insurance.

Subjects: The subjects of this study consisted of all available nurses (50 nurses), who were working at the previously mentioned settings during the time of data collection and provided nursing care to women who were diagnosed with obstetrical emergencies. They were classified as follows: 27 nurses from Tanta University Hospital, 10 from EL-Menshawy Hospital, and 13 from EL-Mabara Hospital.

Tools of data collection:

Tool I: Nurses' Knowledge regarding Obstetrical Emergencies during Pregnancy:

It was developed by the researcher after reviewing the recent related literatures **(Mohammadi et al., 2023, Boushra et al., 2022, Chappell et al., 2021, Dimitriadis et al., 2023, Young et al., 2019, Tonick et al., 2022, Fadl et al., 2019, Skupski, 2019 &Gibson et al., 2020).** It was divided into two parts:

Part one: Socio-demographic characteristics of the participants:

This part included data about nurses′ general characteristics such as: age, residence, educational qualification, and years of experience, previous training courses regarding obstetrical emergencies during pregnancy, its number and date.

Part two: Nurses' Knowledge regarding Obstetrical Emergencies during Pregnancy:

- Including **g**eneral knowledge concerning obstetrical emergencies (five items), components of the emergency crash cart (three items), knowledge regarding vaginal bleeding during pregnancy (seven items), knowledge regarding severe preeclampsia and eclampsia (nine items) and knowledge regarding premature rupture of membranes (five items)

It was categorized as follows:

- Answers which are correct and complete = (2 marks).
- Answers which are correct and incomplete answers = (1 mark).
- Answers which are incorrect and didn't know = (0).

The total score level of knowledge was calculated by (29 questions x 2 = 58). After that, it was classified as follows:

- High level (80 - 100%) = (46 - 58 marks).
- Moderate level (60 - < 80%) = (35- 45 marks).
- Low level (< 60%) = (0 - 34 marks).

Tool II: Nurses' Practices Observational Checklist:

This tool was developed by the researcher after reviewing related literatures **(Mohammadi et al., 2023, Boushra et al., 2022, Chappell et al., 2021, Dimitriadis et al., 2023, Young et al., 2019, Tonick et al., 2022, Fadl et al., 2019, Skupski, 2019, Gibson et al., 2020, Verma, et al., 2022, Seligman et al., 2021, Seif et al., 2022, Cao et al., 2019, Huguelet et al., 2022& Baltaji et al., 2023)** to evaluate nurses' practices. The following five procedures were involved:

- Preparation of the emergency crash cart (nine items), nursing practices of vaginal bleeding during pregnancy (nine items), nursing practices of severe pre-eclampsia

and eclampsia (fourteen items), nursing practices during and after eclamptic fits (sixteen items) and nursing practices of premature rupture of membrane (nine items).

It was categorized as follows:

- Done correctly and completely were scored as (2 marks).
- Done correctly and incompletely were scored as (1 mark).
- Done incorrectly or not done at all were scored as (0).

The total score of practice was calculated by (57 questions x 2 = 114). After that, it was classified as follows:

- Satisfactory practices (≥ 80 %) = (91 - 114 marks).

Unsatisfactory practices (< 80%) = (0 - 90 marks).

Method

The study was executed as the follows: -

1. An official letter outlining the study's objectives received from the Faculty of Nursing Tanta University, as well as given to hospitals' administrators of obstetrics departments at pre mentioned settings (Tanta University Hospital, El-Menshawy and El-Mabara Hospitals) to gain their consent and collaboration for accomplishing the study.
2. **Ethical and legal considerations:**

a) An authorization from the Faculty of Nursing Scientific Research and Ethical committees was attained (code 68/6/2022) and faculty of medicine scientific research ethical committee (code 35484/5/22).
b) In order to obtain the participants' collaboration and consent, the researcher gave a brief introduction about herself and the target of the study.
c) The freedom to pull out whenever was respected.
d) Safety of the participants were protected.
e) Privacy and data confidentiality were guaranteed.

3. **Tools development:**

- Tool I and II were developed by the researcher after reviewing recent related literatures **(Mohammadi et al., 2023, Boushra et al., 2022, Chappell et al., 2021, Dimitriadis et al., 2023, Young et al., 2019, Tonick et al., 2022, Fadl et al., 2019, Skupski, 2019, Gibson et al., 2020, Verma et al., 2022, Seligman et al., 2021, Seif et al., 2022, Cao et al., 2019, Huguelet et al., 2022& Baltaji et al., 2023).**
- **Validity and reliability of the developed tools:**
- Face and content validity were verified by jury test of five experts in the field of Maternal and Neonatal Health Nursing. Based on the opinions of experts, the questionnaire's face validity was evaluated, it was 93.16% and the content validity index (%) of its items was 94% for knowledge questionnaire, 91.50% for practice questionnaire.
- In order to measure reliability, the questionnaire was verified by the pilot subjects at first session to compute Cronbach's Alpha, it was 0.817 for knowledge questionnaire and 0.824 for practice questionnaire.

4. **A pilot study:** It was executed on 10% of the study sample (5 nurses) from the previously mentioned settings in order to test the study tools' clarity, viability, as well as relevance of them. The data gathered from the pilot study were included in the study sample since there wasn't any significant critical alteration in the tools.
5. **The educational program was executed in four phases:**

Phase I: Assessment phase (Pre-test):

- This phase was done before giving the program' sessions. The researcher met with the nurses during the morning shifts at the previously mentioned settings. The nurses were asked to participate in the study after explaining its aim. Then nurses' pre-test was distributed at the beginning by using Tool (I) part one to collect socio-demographic data one time, part two to assess nurses' knowledge regarding obstetrical emergencies during pregnancy. Tool (II) also was used to assess nurses' practices regarding obstetrical emergencies during pregnancy before implementation of the educational program in the presence of the researcher for necessary clarification.
- Nurses' knowledge was assessed individually for each nurse by an interview lasted 30 minutes for each nurse.
- Nurses' practices were assessed by the researcher individually for each nurse lasted10-15 minutes for each procedure.

Phase II: Planning phase: -

A. **Preparation of the educational program sessions:**

The education program was developed by the researcher based on the data from the assessment phase and was guided by relevant literatures. **The educational program included two main parts:**

- **Theoretical part** that included general knowledge concerning obstetrical emergencies, knowledge about components of emergency crash cart, vaginal bleeding during pregnancy, severe pre-eclampsia, eclampsia and premature ruptures of membranes.
- Different teaching methods wad used for theoretical sessions, such as lecture, group discussion, and brainstorming. Suitable teaching media included real objects, PowerPoint presentation, and a designed booklet.
- **Practical part: -** The researcher utilized various teaching approaches for example group discussion, demonstration and re-demonstration supported by instructional media as video and supported real materials to enhance their practices regarding management of obstetric emergency.

B. **Prepare the educational program's content:**

- An educational booklet was developed by the researcher to increase nurses' awareness regarding obstetrical emergencies during pregnancy. It was distributed to nurses on the first day of the training sessions.

Phase III: Implementation phase:

-The nurses were separated into nine groups; six groups included five nurses in each, one group included six nurses and two groups included seven nurses in each according to working circumstances. Each group had six sessions. The sessions were classified into three theoretical and three practical sessions, every session lasting between 30-45 minutes. Each group was trained separately; 3 days weekly during shifts in the morning.

- The program was executed as follows:
- **The first session (theoretical session):** At the beginning an orientation to the educational program and the aims was explained. The researcher provided the nurses with general knowledge about obstetrical emergencies and components of emergency tray.
- **The second session (practical session):** included procedure about preparation of the emergency crash cart.
- **The third session (theoretical session):** included knowledge concerns vaginal bleeding during pregnancy and premature rupture of membranes.
- **The fourth session (practical session):** included nursing management of vaginal

bleeding during pregnancy and premature rupture of membranes.

- **The fifth session (theoretical session):** included knowledge concerns severe pre-eclampsia and eclampsia during pregnancy.
- **The sixth session (practical session):** included nursing management of severe preeclampsia and eclampsia.
- Each session started with feedback and re-demonstration of the previous session and the introduction to the new session's objectives. At the end of each session, the researcher informed the nurses about the next session's objectives and allowed them to ask questions and provided a period of discussion.

Phase IV: Evaluation phase.

- Nurses' performance was assessed by **Tool one part two and Tool two** (three times) before, immediately and three months after the implementation.
- Data was gathered from the beginning of September 2022 to the end of August 2023.

Limitation of the study: -

- Occasionally nurses' schedules interfered with data collecting, thus sessions were rescheduled.

Statistical analysis:

- SPSS (Statistical Package for Social Science) version 25 was utilized to code, enter, tabulate, and analyze the gathered data.
- The range, mean, and standard deviation of quantitative data were determined. When describing a categorical set of data using qualitative methods, such as frequency, percentage, or proportion of each group, Chi-square test ($\chi 2$) utilized to compare two groups and more.
- The Z value of the Mann-Whitney test has been utilized for contrasting the means of two groups of non-parametric data gathered from independent samples. For comparing more than two non-parametric data means, the Kruskal-Wallis ($\alpha 2$) value was determined. Pearson's correlation coefficient (r) was computed to figure out the correlation between the variables.
- In order to interpret the findings of tests of significance, significance was assumed at $p < 0.05$ **(Dawson et al., 2001).**

Results

- **Table (1):** Illustrates the distribution of participants in accordance with their socio-demographic characteristics. That shows more than two fifths of the participant (42.0%) their age was 24-30 years old **with mean age ± SD = 36.92 years ± 8.70.** Also; 74.0% were urban residences, in the same time, 58.0% had secondary technical nursing diplome, while 30.0% had the institute of nursing education and only 12.0% of them had bachelor of nursing education. As regards years of experience, only 20.0% of them had >10-20 years of experience **with a mean years of experience ± SD = 16.84 years ± 9.12.** The table also demonstrates that more than four fifth of them (82.0%) had not obtained any training courses concerning obstetric emergencies during pregnancy before this.
- **Figure (1):** Displays that only 8.0% of the participants had high level of knowledge regarding obstetrical emergencies during pregnancy before the program, which significantly increased to 96.0% immediately and 82.0% three months after (P=0.0001).
- **Figure (2):** Displays that only 4.0% of the participants had satisfactory level of practices before the program implementation, which significantly increased to 96.0% immediately and 86.0% three months after.
- **Table (2):** Illustrates that there was a statistically significant relation between total level of practices and total level of knowledge before the program as well

three months after (P= 0.0001 and 0.024 respectively). Conversely, there was no significant relation between total level of practices and total level of knowledge immediately after the program (P=0.768).

- **Figure (3):** Displays a significant positive correlation between total knowledge scores and total practice scores before the program implementation (P=0.002).
- **Figure (4):** Illustrates a significant positive correlation between total knowledge scores and total practices scores immediately after the program implementation (P=0.005).
- **Figure (5):** Displays a significant positive correlation between total knowledge scores and total practices scores three months after the program implementation (P=0.002).
- **Table (3):** Displays a highly statistical significant relationship between the studied nurses' total knowledge scores and their age, educational qualification and years of experience before, immediately and three months after implementation of the educational program, as well as between the studied nurses' total knowledge scores and their attending of training courses before implementation of the educational program.
- **Table (4):** Shows a highly statistical significant relationship between the studied nurses' total practices' scores and their age, educational qualification and years of experience before, immediately and three months after implementation of the educational program, as well as between their total practices scores and their attending training courses before the program and three months after implementation of educational program.

Table (1): Sociodemographic characteristics of the participant (n=50).

Sociodemographic data	The studied nurses (n=50)	
	N	%
Age (years)		
24 - 30	21	42.0
> 30 - 45	10	20.0
> 45 - 51	19	38.0
Range	24-51	
Mean ± SD	36.92±8.70	
Residence		
Urban	37	74.0
Rural	13	26.0
Educational qualification		
Diploma	29	58.0
Institute of nursing	15	30.0
Bachelor of nursing	6	12.0
Years of experience		
≤ 10	20	40.0
> 10 - 20	10	20.0
> 20 - 30	20	40.0
Range	1-30	
Mean ± SD	16.84 ± 9.12	
Attending of previous training courses regarding obstetrical emergencies during pregnancy		
No	41	82.0
Yes	9	18.0
-If yes, number of previous training course		
Once	9	100.0
-Date of previous training course		
≥5 years	9	100.0

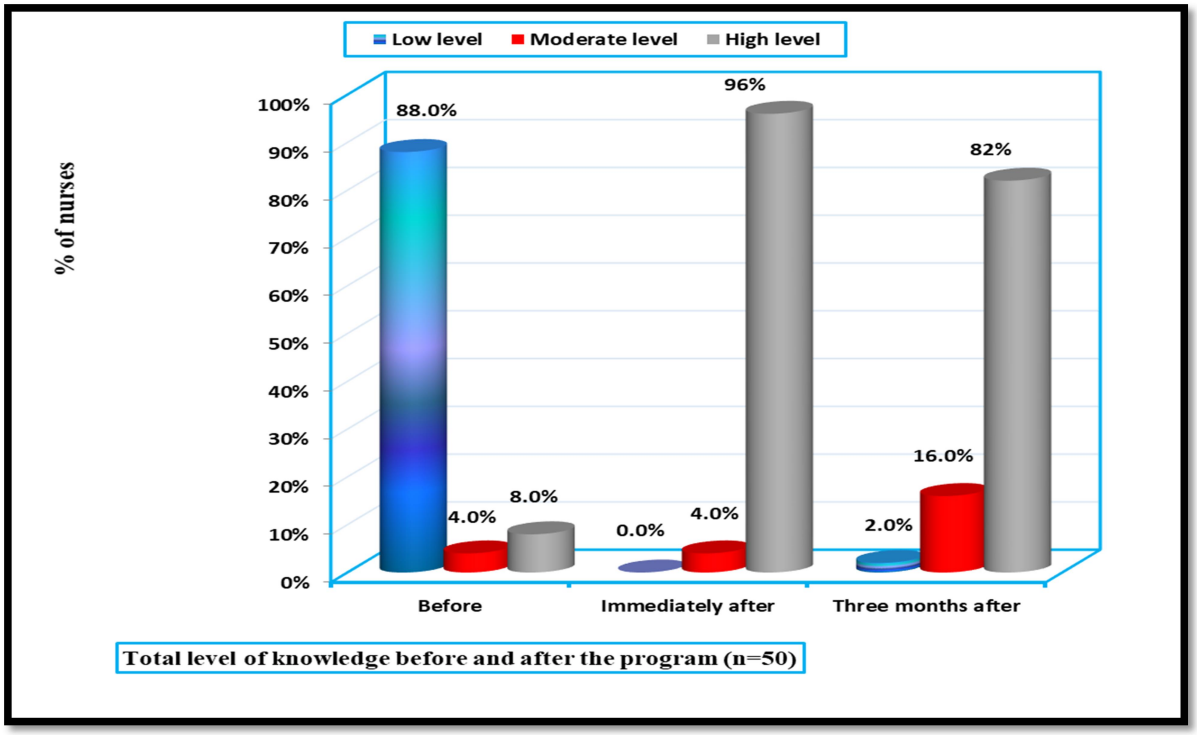

Figure (1): Total level of knowledge about obstetrical emergencies during pregnancy (n=50).

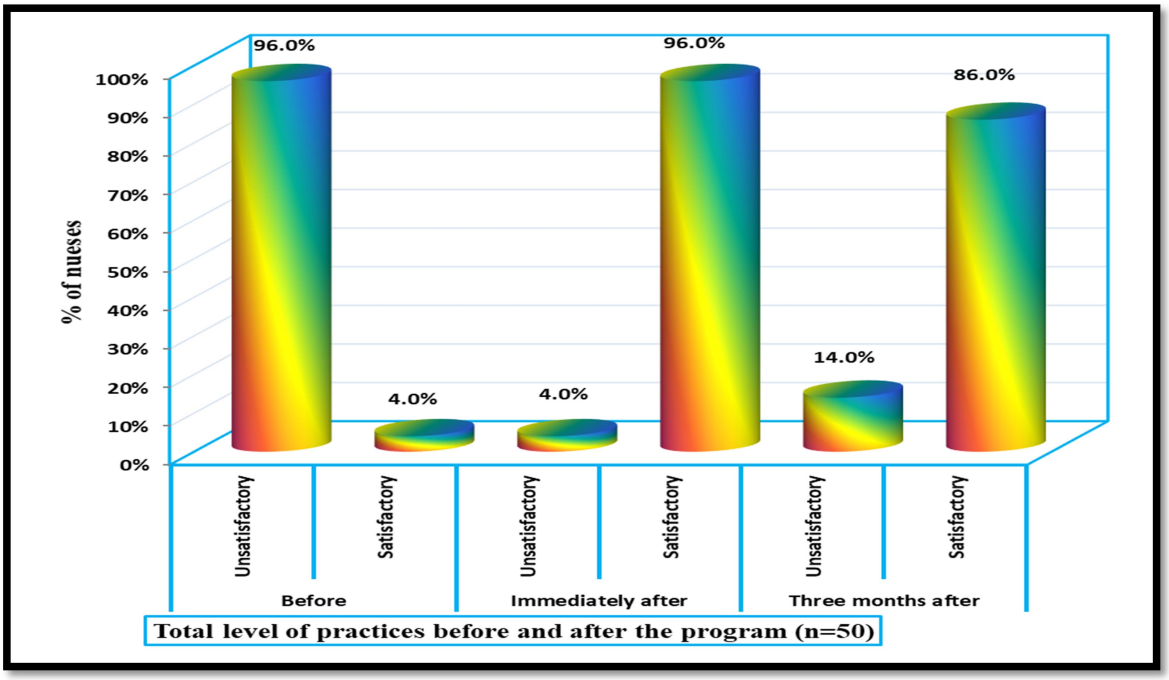

Figure (2): Total level of practices about obstetrical emergencies during pregnancy (n=50).

Table (2): Relation between the total level of practices about obstetrical emergencies during pregnancy and total level of knowledge (n=50).

Total level of practices	Total level of knowledge before and after program implementation (n=50)							
	Low level		Moderate level		High level		χ^2 test	P value
	n	%	n	%	n	%		
Before program	(n=44)		(n=2)		(n=4)			
Unsatisfactory	44	100	2	100	2	50.0	23.958	0.0001*
Satisfactory	0	0	0	0	2	50.0		
Immediately after program			(n=2)		(n=48)			
Unsatisfactory			0	0	2	4.2	0.087	0.768
Satisfactory			2	100	46	95.8		
Three months after program	(n=1)		(n=8)		(n=41)			
Unsatisfactory	1	100	0	0	6	14.6	7.459	0.024*
Satisfactory	0	0	8	100	35	85.4		

*Statistically significant (P<0.05)

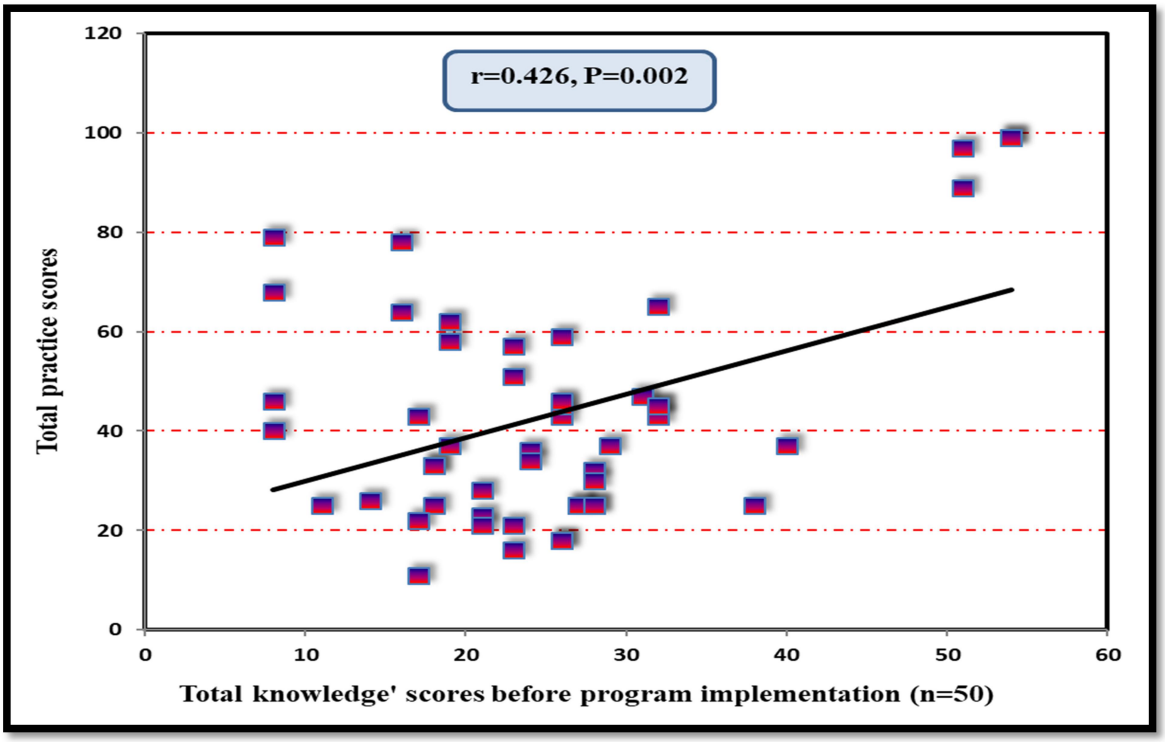

Figure (3): Correlation between total knowledge scores and total practice scores before the program implementation (n=50).

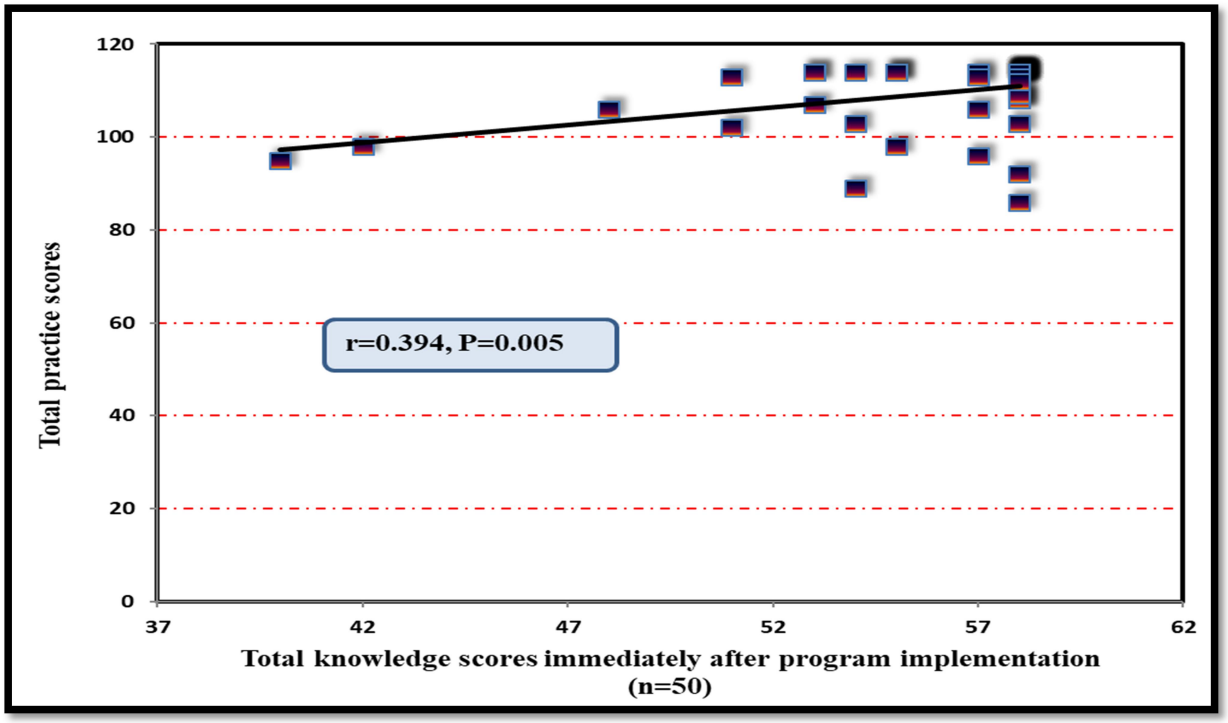

Figure (4): Correlation between total knowledge scores and total practice scores immediately after the program (n=50).

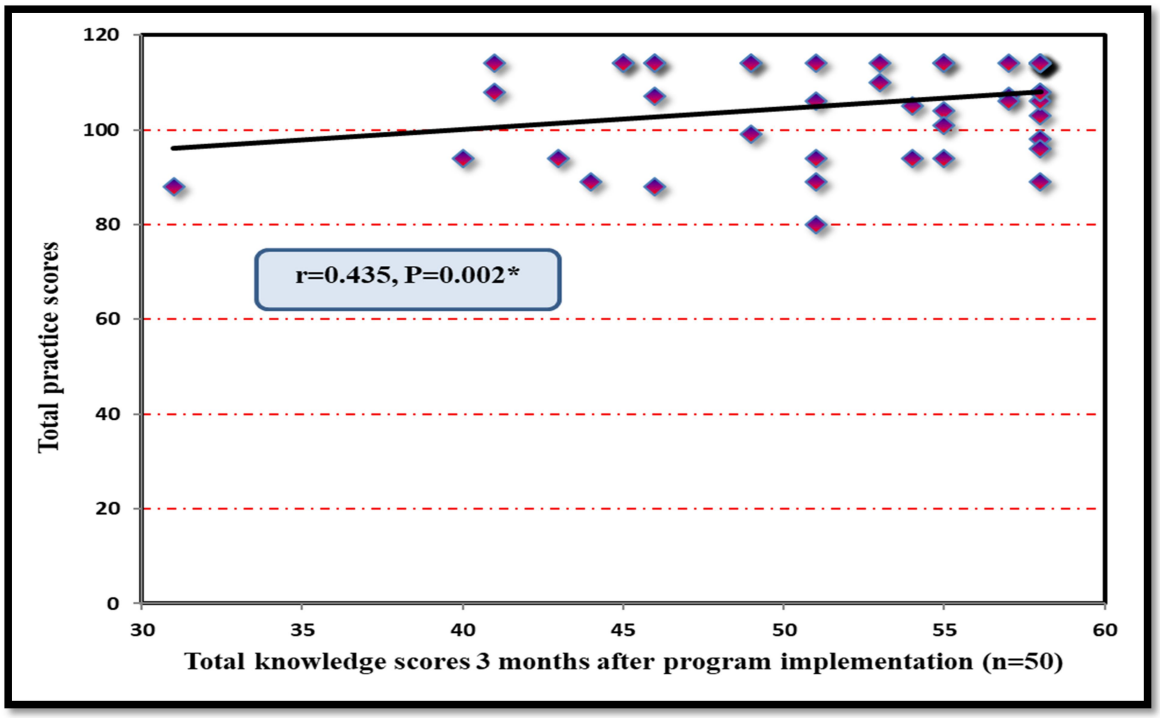

Figure (5): Correlation between total knowledge scores and total practices scores three months after the program.

Table (3): Relation between total knowledge scores regarding obstetrical emergencies during pregnancy and sociodemographic characteristics of the studied nurses before, immediately and three months after implementation of the educational program (n=50).

Sociodemographic characteristics	Total knowledge scores of the studied nurses before and after the program implementation (n=50)					
	Before		Immediately after		Three months after	
	Mean ± SD	Z value or χ^2 value P value	Mean ± SD	Z value or χ^2 value P value	Mean ± SD	Z value or χ^2 value P value
Age years						
24-30	29.62±13.13	3.650	59.00±2.31	4.012	55.80±4.37	3.904
>30-45	24.05±9.06	0.0001*	56.48±2.75	0.0001*	52.14±6.25	0.0001*
>45-51	21.50±8.60		53.89±5.27		51.84±7.52	
Residence						
Urban	26.67±11.42	1.397	55.70±4.31	0.292	51.94±6.50	0.768
Rural	20.38±8.14	0.163	56.77±2.17	0.771	53.54±6.14	0.442
Qualification						
Diploma	22.73±13.51	3.741	53.20±4.23	3.888	50.69±6.87	4.210
Institute of nursing	25.27±6.91	0.0001*	56.07±4.03	0.0001*	52.73±5.86	0.0001*
Bachelor of nursing	31.07±18.81		59.50±1.22		56.67±5.43	
Experience years						
1-10	28.95±13.38	3.874	59.40±2.80	5.621	56.50±4.14	4.114
>10-20	24.00±8.82	0.0001*	57.00±2.31	0.0001*	52.15±7.45	0.0001*
>20-30	21.30±8.59		53.05±5.17		50.00±6.37	
Attending training courses						
No	13.33±7.47	3.885	55.00±3.60	1.781	51.33±6.56	0.684
Yes	27.60±9.90	0.0001*	56.19±3.94	0.075	52.58±6.41	0.494

Statistically significant (P<0.05)

Table (4): Relation between total practices scores regarding obstetrical emergencies during pregnancy and sociodemographic characteristics of the studied nurses before, immediately and three months after implementation of the educational program (n=50).

Sociodemographic characteristics	Total practices score of the studied nurses before and after program implementation (n=50)					
	Before		Immediately after		Three months after	
	Mean ± SD	Z value or χ^2 value P value	Mean ± SD	Z value or χ^2 value P value	Mean ± SD	Z value or χ^2 value P value
Age years						
24-30	48.62±30.15	3.489	110.50±8.81	4.612	109.80±8.27	5.417
>30-45	40.68±14.79	0.0001*	106.42±8.80	0.0001*	104.09±11.30	0.0001*
>45-51	37.20±14.70		104.00±8.15		101.89±8.27	
Residence						
Urban	45.40±23.92	0.897	109.13±7.84	0.012	103.05±12.84	1.585
Rural	36.61±17.10	0.370	110.23±6.60	0.990	108.85±8.38	0.113
Qualification						
Diploma	36.00±16.73	4.897	106.13±8.42	4.321	101.33±10.03	4.231
Institute of nursing	50.73±25.82	0.0001*	110.07±7.50	0.0001*	104.17±13.83	0.0001*
Bachelor of nursing	53.67±31.81		112.00±3.10		109.50±5.72	
Experience years						
1-10	49.90±30.39	4.201	110.60±5.88	4.321	109.40±8.58	4.877
>10-20	41.20±14.58	0.0001*	108.50±8.81	0.0001*	104.10±14.29	0.0001*
>20-30	34.40±14.66		104.70±8.24		101.60±11.36	
Attending training courses						
No	40.05±22.62	5.521	108.95±8.05	0.296	100.19±12.80	3.814
Yes	54.55±20.65	0.0001*	111.55±3.54	0.768	110.78±6.86	0.0001*

***Statistically significant (P<0.05)**

Discussion

Life-threatening disorders that might arise throughout pregnancy, childbirth, or postpartum period are identified as obstetrical emergencies. These disorders can endanger the health of the pregnant woman as well as her fetus **(Zewde, 2022).** Even so, the majority of obstetric emergencies are defined and have extensively known therapeutic approaches, Maternal mortality statistics keep highlighting the widespread and deficient care of obstetric emergencies which consequently contributes to increased morbidity and mortality rate. So, nurses should have clinical competencies in determining pregnant woman's health risk and managing life-threatening situations **(Mahada et al., 2023).**

Concerning socio-demographic characteristics of the studied nurse, it founded that almost two fifths of them aged from 24-30 years old with mean age ± SD 36.92 years ± 8.70. This result is in agreement with **Kumar M et al., (2021)** who conducted "a descriptive study to assess the knowledge of staff nurses regarding obstetrical emergencies and its management in a selected hospital of greater Noida". They illustrated that more than two fifths of their nurses from 26 to 30 years old. On contrast, **Abd Elmordy et al., (2018)** they studied the effect of an instructional package on nurses' performance regarding obstetrical emergencies demonstrated that nearly half of them were in the 30-39 years old with mean age ± SD 32.81 years ±7.38.

As regards to the studied nurses' residence, it founded that almost three quarters of them were living in urban areas. This aligns with **Mohammed & Ghafel (2022)** who studied the effectiveness of educational program on nurse's knowledge and practices regarding management of pregnancy with danger signs, they mentioned that the majority of the studied nurses were from urban area.

Concerning the studied nurses' educational qualification, it revealed that nearly three fifths had secondary technical nursing diplome. This coincides with **Abd Elmordy et al., (2018),** who revealed that almost two thirds of participants had diploma nursing graduates.

Regarding the studied nurse years of experience, it declared that two fifths of them had ≤ 10 years' experience and also had >20-30 of them years' experience with mean years of experience ± SD 16.84 years ± 9.12 years. The present findings are consistent with **El Sharkawy et al., (2020),** which evaluated the effect of simulation-based educational program on maternity nurses' performance regarding obstetrical emergencies during pregnancy, who clarified that more than half of them had more than10 years of experience with mean years of experience ± SD 8.68 years ± 3.97. On the other hand, this finding is contradicted with **Abd Elmordy Z et al., (2018)** [28] who stated that more than two thirds of them had more than 10 years of experience with mean years of experience ± SD 13.89 years ± 8.31. The discrepancy between the results of the present study and the mentioned study results may be related to different settings where the studies were conducted.

As regards to their attendance of training courses regarding obstetrical emergencies during pregnancy; it was shown that more than four fifths of them had never taken any training courses that may affect negatively the quality of care delivered to women with obstetrics

emergencies. This matched with **El Sharkawy et al., (2020)** who clarified that higher percent of participants didn't take any training classes about obstetrics emergencies.

Concerning the total level of knowledge about obstetrical emergencies during pregnancy, it illustrated a statistically significant improvement in the total level of knowledge immediately and three months following the program. This aligns with **El Sharkawy et al., (2020)** they] reported that the minority of studied nurses had good level of knowledge regarding obstetrical emergencies pre-intervention, compared to the majority of them had good level of knowledge after the intervention. Additionally; **Abd Elmordy et al., (2018)** revealed that the minority of the studied nurses had good level of knowledge regarding obstetrical emergencies before implementation of the instructional package, while the most of them had good level of knowledge immediately after and then declined slightly at the follow up phase, with a statistical significant difference. This similarity between the current study and the above mentioned studies may be attributed to the effectiveness of the educational program on improving the overall nurses' knowledge regarding obstetrical emergencies.

Concerning the total level of practices regarding obstetrical emergencies during pregnancy, the minority of them had satisfactory level of practices before the program, which significantly improved immediately and three months after. This might be explained by deficiency of knowledge reflected in practice, and that more than four fifths of them didn't take any prior training sessions concerning obstetrical emergencies. This can be elucidated by that the educational program provided the nurses an opportunity for retraining and improving their competencies in performance at emergent clinical situation through demonstration and re-demonstration sessions.

The present study's result in congruence with the results of **El Sharkawy et al., (2020)** they showed that the majority of the participants had satisfactory level of practices concerning obstetrical emergencies post-intervention compared to pre-intervention. Again, **Amatullah, (2018)** which studied "Using inter-professional simulation-based training to improve management of obstetric emergencies: A systematic review". He confirmed an improvement in the nurse's skills, patient security, and quality of care concerning obstetric emergencies after the training. **Moreover,** the findings of the existing study are aligning with **Abd Elmordy et al., (2018)** they concluded that the nurses' practices enhanced immediately after and at the follow-up phase than before implementation of the instructional package regarding obstetrical emergencies.

Regarding the relation between the studied nurses' total level of practices and their total level of knowledge before, immediately and three months after implementation of the educational program regarding obstetrical emergencies during pregnancy, it was shown that there was a statistical significant relation between total level of practices and total level of knowledge before the program as well as three months after the program. Oppositely, there was no statistical significant relation between their total level of practices and their total level

of knowledge immediately after the program. From the researcher's point of view, this result may be due to that the good level of knowledge has positive effect on the level of practice.

Concerning correlation between total knowledge scores and total practice scores of the studied nurses before, immediately and three months after implementation of the educational program regarding obstetrical emergencies during pregnancy, it was stated that a significant positive correlation between total knowledge scores and total practices scores before, immediately and three months after the program. This is compatible with **El Sharkawy et al., (2020)** that shows a positive highly statistical significant correlation between them pre the intervention, immediately post the intervention, and at the follow-up phas. Again, this aligns with **Abd Elmordy et al., (2018)** they found a positive statistical correlation between total knowledge and total practice scores before, immediately after and at follow-up phases. This indicates that nurses' knowledge were reflective of their practices, which is improved by the use of effective educational program regrading obstetrical emergencies during pregnancy.

As regard to the relation between the studied nurses total knowledge scores regarding obstetrical emergencies during pregnancy and their sociodemographic characteristics before, immediately and three months after implementation of the educational program, it was noticed that there was a highly statistical significant relationship between the studied nurses' total knowledge scores and their age, educational qualification and years of experience before, immediately and three months after implementation of the educational program, as well as between the studied nurses' total knowledge scores and their attending of training courses before implementation of the educational program.

The current study findings are compatible with **Gad elrab et al., (2020)** who assessed the effect of educational program on maternity nurses' knowledge about antepartum hemorrhage at women's health hospital, Assiut University, and found a relation between total knowledge of their participant and their age, educational qualification, and years of experience pre-test and post-test, as well as there was no relation between total knowledge and workplace and attending training courses. On the other hand, these finding contradicted with **Kumar et al., (2021)** who pointed out that there was no significant association between the knowledge score of their participant and their age and professional qualifications. From the researcher's point of view, this means that nurses' level of knowledge is better among small age groups, with higher education, which may attribute to the fact that young-age' nurses have the ability to remember and retrieve information easily.

Concerning the relation between the studied nurses total practices' scores regarding obstetrical emergencies during pregnancy and their sociodemographic characteristics before, immediately and three months after implementation of the educational program, it was noticed that there was a highly statistical significant relationship between the studied nurses' total practices' scores and their age, educational qualification and years of experience

before, immediately and three months after implementation of the educational program, as well as between their total practices scores and their attending training courses before the program and three months after implementation of educational program. These findings are aligning with **Ezz et al., (2021)** who implemented a study to evaluate the effect of emergency obstetric protocol on the practices of intern nursing students. They reported that there was a relationship between total practices and educational level, years of experience, and training course attendance.

Hense, the main causes of poor level of knowledge and unsatisfactory practices regarding obstetrical emergencies during pregnancy due to that the majority of the studied nurses have diplome qualification, excessive work load and they didn't have continuous in-service training programs at the different health care settings.

Therefore, providing continues in-service educational and training programs regarding obstetrical emergencies during pregnancy for the maternity nurses is crucial. Finally, based on the findings of the present study, it can be concluded that the research hypothesis of this study has been achieved. This was revealed through the significant improvement of the maternity nurses' performance immediately, as well as three months after implementation of the educational program regarding obstetrical emergencies during pregnancy than that before the program implementation.

Conclusion

-The nurses' performance is improved post implementation of the educational program concerning obstetrical emergencies during pregnancy. It was revealed throughout the significant improvement of maternity nurses' performance immediately and after three months.

Recommendations

-Based on the study's findings, we suggested that refreshing the head nurse role in planning, directing, as well as appraising the offered care to women for addressing and managing any areas of weakness to achieve and maintain the best nursing care during obstetrical emergencies.

-Written protocols and strategies should be established for refining the excellence nursing care delivered to women during obstetrical emergencies.

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