

Effect of Educational Program on Nurses' Perception regarding Obstetric Triage

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Abstract

Background: Obstetric triage is one of the most important management and decision-making. **Aim of the research:** Was to evaluate the effect of educational program on nurses' perception regarding obstetric triage. **Research setting:** The study was conducted at obstetrics and gynecological emergency department at Benha University Hospital. **Study design:** A quasi-experimental design (one group, pre-posttest) was followed to fulfill the aim of the study. **Study sampling:** A convenient sample included 40 nurses. **Tools of data collection:** Two tools were used of data collecting data, self-administered questionnaire and modified likert scale for nurse's attitude toward obstetric triage **Results:** The minority and less than one tenth of the studied nurses have good knowledge and positive attitude regarding obstetric triage before implementation of educational program which improved to most of the studied nurses have good knowledge and positive attitude after one month from implementation of educational program, with highly statistical significant difference ($P \leq 0.001$). **Conclusion:** The educational program has a positive effect on improving nurses' knowledge and attitude regarding obstetric triage. **Recommendation:** Implementing continuous educational training programs about obstetric triage for maternity nurses should be provided.

Keywords: Educational program, Nurses' perception, Obstetric triage.

Introduction

A triage system is a process of collecting patient information and initiating a decision-making process that categorizes and prioritizes the needs of patients seeking care. Triage in hospitals typically is associated with emergency departments that aim to categorize and prioritize patients who present for emergent or urgent care. Emergency departments should structure triage guidelines for health care providers encountering the diverse cases may present to units (Richhariya, 2022).

Obstetric triage is the brief, thorough and systematic maternal and fetal assessment performed when a pregnant woman presents for care, to determine

priority for full evaluation. Obstetric triage is clearly part of obstetric care and is the gatekeeper for initial assessment and evaluation of labor and other obstetric and non-obstetric complaints of pregnant women (Long, 2021).

The obstetric triage reduces maternal mortality by accelerating the provision of appropriate care at the right time and place to the high-risk pregnant woman. The ideal obstetric triage system should be able to accurately identify mothers or fetuses in need of emergency care and provide conditions for quick access to medical diagnostic procedures (Forna et al., 2023; Kenyon, 2021).

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The goal of establishing an obstetric triage system is to ensure the right and timely treatment is delivered to the right mother or fetus. Delay in receiving appropriate care is one of the causes of maternal and fetal mortality. Thus, the triage should be able to distinguish a mother who only needs primary treatment and direct the woman to fast track unit or waiting room. And, cases are critically ill should be transferred to the emergency room to receive faster and more appropriate treatment (**Lindroos et al., 2021**).

The role and benefits of obstetric triage in the care of pregnant women has expanded significantly. The contemporary obstetric triage facility must have processes in place to provide a medical screening examination that complies with regulatory statues while considering both the facility's maternal level of care and available resource (**Lull and Svancarek, 2021**).

Nursing perception is a required process in obstetrics emergency to ensure the quality of care is met and provide nurse with the information necessary to determine whether are meeting expectations or can do better to improve performance. Attitude is the tendency to organize thoughts, feelings and possible behaviors about individuals, places, events or ideas and the tendency to initiate or perform a certain behavior. Positive attitudes toward obstetric triage are associated with positive experiences and negative attitudes are associated with both negative experiences of nurses (**Koyuncu et al., 2022**).

Education program is a program principally engaged in the provision of nursing education and acquisition of knowledge and attitudes and helps nurses to positive attitude properly in obstetric emergency department including job training, career and technical education.

Educational program for nurses is a planned of activities designed to improve nurses perception to become better professionals. Nursing education program means a course of instruction offered and conducted to prepare nurses for the practice of nursing or to increase knowledge and skills of nurses (**Baltaji et al., 2023**).

Significance of the study

Maternal morbidity and mortality are major public health problem, especially in West Africa, where maternal mortality ratios are still very high, most maternal deaths occur during or few hours after delivery. Hemorrhage, hypertension, obstructed labor and sepsis are the major direct emergency obstetric causes (**Mo'men et al., 2020**). Each year, an estimated 303,000 women die during pregnancy, labor and the postpartum period. The vast majority 95% of maternal deaths occur in low and middle income countries. Globally, ending preventable maternal deaths continues to be one of the most important goals (**Torri et al., 2021**). In Egypt, approximately 2,900 women and girls die each year due to pregnancy-related complications. Additionally, another 58,000 to 87,500 Egyptian women and girls will suffer from disabilities caused by complications during pregnancy and childbirth each year, (**Mohammed et al., 2022; WHO, 2018**).

Several previous studies (**Belizan et al., 2021; Hasleton et al., 2021; Dafang et al., 2021; Bisson et al 2019**) have shown that poor triage for pregnant women and defects in knowledge and risk assessment are infrastructural problems of maternal mortality and obstetric adverse outcomes. Education and training system for preparation obstetrics emergency nurses still insufficient compared with the growing demand for emergency services (**Duko et al., 2019**). Therefore, the

ongoing improvement of obstetrics nurses' knowledge and attitude regarding obstetric care is a corner stone to a high quality health care. Thus, this study was conducted to evaluate the effect of educational program on nurses' perception regarding obstetric triage.

Aim of the study

This study aimed to evaluate effect of educational program on nurses' perception regarding obstetric triage.

Research hypotheses

- 1- Nurses will exhibit higher level of knowledge scores regarding obstetric triage after implementation of educational program than before.
- 2- Nurses will exhibit a positive attitude after implementation of educational program than before.

Research design:

A quasi - experimental design (one group, pre-posttest) was followed to fulfill the aim of the study.

Research setting:

The study was conducted at obstetrics and gynecological emergency department affiliated to Benha University Hospitals.

Sampling:

- **Sample type:** A convenient sample.
- **Size:** All nurses (40) who were working at obstetrics and gynecological emergency department at Benha University Hospital during the time of data collection which were (40) nurses.

Tools for data collection:

Two tools were used for data collection.

Tool (I): A self-administrated questionnaire: It was developed by the researcher after reviewing related literature (Nishimwe et al., 2022; Verma et al., 2021; Kavitha et al., 2019): It was written in Arabic language which covered the following two parts:-

Part (1): General characteristics of the studied nurses, included (age, level of

education, current job, years of experience, attendance any training program about obstetric triage, number of program and time since attendance of program).

Part (2): Nurses' knowledge regarding obstetrics triage that divided into 2 sections included (33 items). First section: general knowledge regarding obstetrical emergencies, it consisted of (11 items). Second section: Knowledge regarding obstetric triage, it consisted of (22 items).

Scoring system of knowledge:

Each item was assigned a score of (3) when the answer was completely correct, a score (2) given when the answer was incomplete correct and a score (1) was given when the answer was don't know. The total score of knowledge of participant was ranged from 33-99 and was classified as the following: Poor knowledge when the total score was less than 60% (1-59 score). Average knowledge when the total score was 60% to less than 75% (60-74 score). Good knowledge when total score was 75% to 100% (75-99 score).

Tool (II): Modified likert scale for nurse's attitude toward obstetric triage:

This scale was developed by the researcher after reviewing of literature from (Ruhl, 2018; Elsayed et al., 2014) to assess nurses's attitude toward obstetric triage. It consisted of 14 items.

Scoring system:

Each item was rated according to three-point Likert scale, a score (3) for agree, score (2) for neutral and score (1) for disagree. The total score was ranged from 14-42 and categorized as the following: Negative attitude when the total score < 75% (1< 25 score). Positive attitude when the total scores $\geq 75\%$ (25 \leq 42 score).

Tool validity and reliability:

Tools validity: the tools of data collection were tested and reviewed for its

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content validity by panels of three experts in the field three of Nursing Assistant Professors at Benha Faculty of Nursing to test content validity. The Jury's opinions were elicited regarding the tools format layout, consistency and scoring system. The experts reviewed the tools for clarity of sentences, appropriateness of contents, sequence of items, accuracy, relevance and comprehensiveness.

Reliability: The reliability was done by Cronbach's Alpha coefficient test. Which revealed that each tool consisted of relatively homogenous items as indicated by moderate to high reliability of tools. The internal consistency of knowledge reliability statistics Cronbach's Alpha was 0.912 and attitude reliability statistics Cronbach's Alpha was 0.897.

Ethical considerations:

Approval from the Faculty of Nursing Ethical Committee, Benha University was obtained to conduct this study. The nurses were informed the participant in study about the purpose and benefits of the research at the beginning of the interview and throughout the study stages. Oral consent was obtained from each nurse before starting data collection. The nurses were ensured that the data were remaining confidential and use for study purposes only. The nurses's right to autonomy and freedom from harm was ensured. The nurses were also given an unconditional right of withdrawal at any time.

Pilot study:

The pilot study was carried out on ten percent of the total sample size (4 nurses) to assess simplicity, clarity and applicability of data collection and estimated the time required to fill in the tools.

Fieldwork:

The current study was conducted from the beginning of December, 2020 and completed at the end of November, 2021 covering 12 months. The researcher visited

the previously mentioned setting three days/week (Saturday, Monday and Wednesday) from 9.00 Am to 2.00 Pm. This study was conducted through four sequential phases included interviewing and assessment phase, planning phase, implementation phase and evaluation phase.

Interviewing and assessment phase:

At the beginning of interview the researcher greeted each nurse and introduced herself, explained the purpose of the study to each nurse then the researcher provided the nurses with all information about the study (purpose and duration and activities) to gain confidence and cooperation and then obtained the oral consent from participate in the study. Data was collected through distributing tool I: A self-administrated questionnaire to assess general characteristics and nurses' knowledge regarding obstetrics emergency and triage. Tool II: Modified likert scale for nurse's attitude toward obstetric triage to assess the nurses' attitude toward obstetric triage. The average time required for completion of the questionnaires was around (35-45 minutes). The data obtain during this phase was constituted the baseline for further comparison to evaluate the effect of educational program on nurses' knowledge and attitude regarding obstetric triage.

Planning phase:

Based on results obtained during assessment phase, educational booklet was developed by the researcher after reviewing related literature. The booklet was written in simple Arabic language to suit all level of understanding and to satisfy the studied nurses' deficit knowledge and attitude regarding obstetrics triage. It was illustrated by colored pictures. Educational sessions' number, contents and objectives were determined. The general objectives were by the end of the sessions, each nurse would be able to acquire essential knowledge and have

positive attitude regarding obstetrics triage. Different teaching methods used such as lecture and group discussion with the assistance of the instructional media as video and power point presentation.

Implementation phase:

Implementation of the educational program was carried out at the pre mentioned setting. The researcher divided the nurse into 8 groups according to working circumstances and nurses' physical and mental readiness. Each group included five nurses. Then the researcher designed and applied 5 theoretical sessions for each group and the duration of each session was ranged from 45-60 minutes. The sessions were conducted as the following: First session: at the beginning of the first session the researcher gave the nurses the booklet and introduced an orientation of the educational booklet including the general and specific objectives by using Arabic languish to suit all level of education, the researcher provided nurses with knowledge about definition of obstetrical emergencies, classifications of obstetrical emergencies, provided nurses' knowledge about factors lead to obstetric emergency during pregnancy, factors lead to obstetric emergency during labor, factors lead to obstetric emergency during post-partum. At the end of the session the researcher gave nurses the opportunity to ask questions and provided a period of discussion and instructed them for the time of the next visit. Second session: started by feedback about the previous session and introduction of the objectives of the new session, provided nurses' knowledge about complications during pregnancy, complications during labor and complications during post-partum, necessary equipment for providing emergency nursing care, priorities of nursing care for obstetric emergencies and component of comprehensive obstetrics emergency. At the end of each session, the

researcher was giving five minutes devoted to permit nurses to ask questions to clarify the session contents and to correct any misunderstanding. Each nurse was informed about the time of the next sessions. Third session: started by feedback about the previous session and introduction of the objectives of the new session, the researcher discussed the definition of obstetric triage, aims of obstetric triage, condition of obstetric triage, uses of obstetric triage, benefits of obstetric triage, factors affecting obstetric triage, nursing roles of obstetric triage and steps of obstetric triage. At the end of the session the researcher gave nurses the opportunity to ask questions and provided a period of discussion and instructed them for the time of the next visit. Fourth session: started by feedback about the previous session and introduction of the objectives of the new session, the researcher explained the evaluation criteria of obstetric triage, level of obstetric triage, colors of obstetric triage, indication of red color, cases are sorted in red color, indication of orange color and cases are sorted in orange color. At the end of the session the researcher gave nurses the opportunity to ask questions and provided a period of discussion and instructed for the time of the next visit. Fifth session: started by feedback about the previous session and introduction of the objectives of the new session, the researcher described indication of yellow color, cases are sorted in yellow color, indication of green color, cases are sorted in green color, indication of blue color, cases are sorted in blue color and method of improving obstetric triage utilization.

Evaluation phase:

One month after implementation of the educational program, the researcher used the same previous format of pretest. Tool I "part 2" and tool II as Posttest to evaluate the

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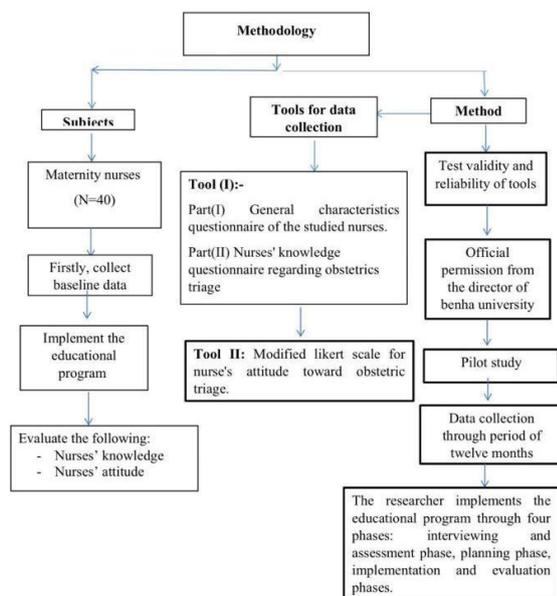
effect of educational program on nurses' perception regarding obstetric triage.

Statistical analysis:

After data collection each sheet was scored and data were organized and categorized and analyzed by using the statistical package for social sciences (SPSS) program version (25). Qualitative data was expressed by frequencies and percentages. Quantitative data was expressed by mean and standard deviation (SD). Test of significance were Fisher Exact Test (FET) and painted test. As well as person correlation coefficients (r) were used. Significance of results were considered as the following: there is no statistical significance difference when $p > 0.05$ and a statistical significance difference when $p \leq 0.05$ and there is highly statistical significance difference when $p \leq 0.001$.

Limitation of study:

Sometimes, schedule of sessions were postponed as many nurses were busy most of time due to increased workload and limited number of the nurses in department.



Results:

Table (1) clarifies that 55.0% of the studied nurses were in the age group of 30 < 40 years with a mean age of 31.92 ± 5.89

years and 52.5% of the studied nurses were diploma nursing graduated. Regarding current job, the majority of the studied nurses 95.0% were assigned as nurse. Moreover, 62.5% of the studied nurses had ≥ 10 years of experience with mean 11.83 ± 5.57 years.

Figure (1) shows that, the minority of nurses had good knowledge regarding obstetrics emergency and obstetrical triage before implementation of the educational program. While, most of them had good knowledge after one month of from implementation of educational program ($p=0.000$).

Figure (2) reveals that, less than on tenth of nurses had positive attitude towards obstetrical triage before implementation of the educational program. While most them had positive attitude after one month from implementation of educational program ($p=0.000$).

Table (2) shows that there was a statistically positive correlation between total knowledge and total attitude scores about obstetric triage before implementation of educational program and after one month from implementation of educational program ($P \leq 0.001$).

Table (3) illustrates that there was a highly statistically significant relation between total nurses' knowledge and age, level of education and attendance of training program before implementation of the educational program ($P \leq 0.001$). Moreover, there was a statistically significant relation between total nurses' knowledge and current job and years of experience before implementation of the program ($P \leq 0.05$). After one month from implementation of educational program, there was a highly statistically significant relation between total nurses' knowledge and age ($P \leq 0.001$). Meanwhile, there was no statistically

significant relation between total nurses' knowledge and level of educational, attendance of training program, current job years of experience ($P>0.05$).

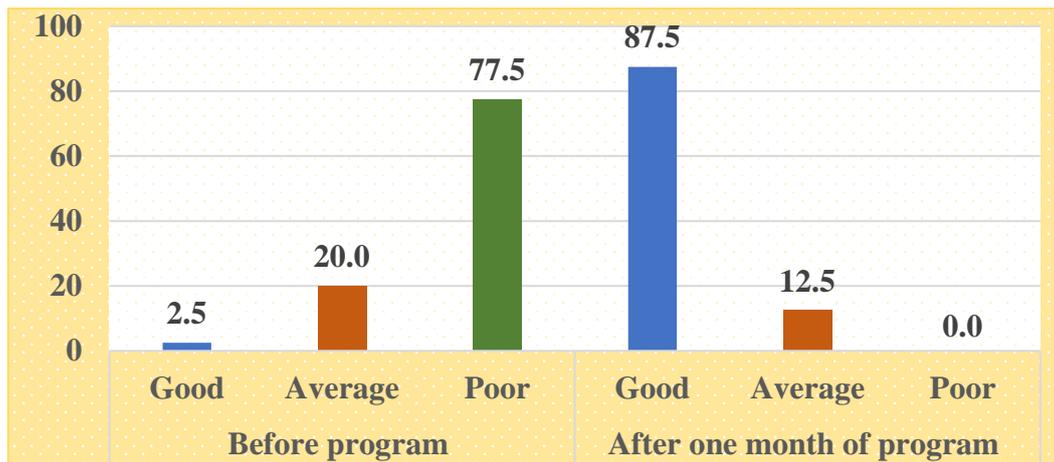
Table (4) shows that there was a statistically significant relation between total nurses' attitude and age, level of education, years of experience and attendance of any training program before implementation of educational program ($P \leq 0.05$). Moreover, there was no statistically significant relation

between total nurses' attitude and current job before implementation of the program ($P>0.05$). After one month from implementation of educational program, there was a statistically significant relation between total nurses' attitude and age, level of education and years of experience ($P \leq 0.001$). Meanwhile, there was no statistically significant relation between total nurses' attitude current job and attendance of training program ($P>0.05$).

Table (1): Distribution of the studied nurses according to general characteristics (n=40)

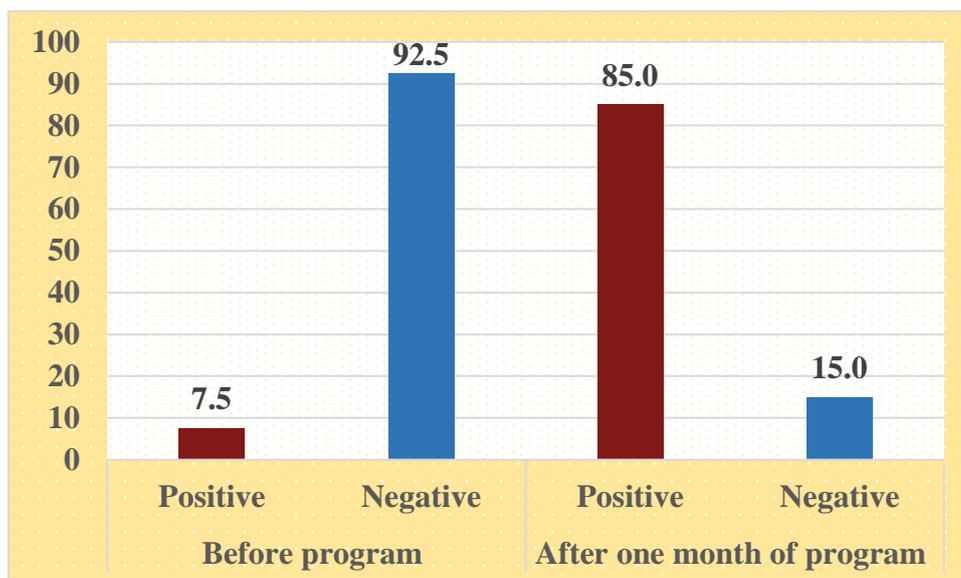
General characteristics	n=40	
	No.	%
Age (years)		
20 < 30	15	37.5
30 < 40	22	55.0
40 < 50	3	7.5
Mean ± SD	31.92 ± 5.89	
Level of education		
Diploma of nursing.	21	52.5
Technical nursing institute.	17	42.5
Bachelor of nursing.	2	5.0
Current job		
Nurse	38	95.0
Head nurse	2	5.0
Years of experience		
1 < 5	4	10.0
5 < 10	11	27.5
≥10	25	62.5
Mean ± SD	11.83 ± 5.57	

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FET=62.563 P- value=0.000

Figure (1): Distribution of the studied nurses according to level of total knowledge regarding obstetrics emergency and obstetric triage before and after one month from implementation of educational program (n=40)



FET= 48.322 P- value=0.000

Figure (2): Distribution of the studied nurses according to level of attitude towards obstetric triage before and after one month from implementation of educational program (n=40)

Table (2): Relation between the studied nurses' level of knowledge score and general characteristics before and after one month from implementation of educational program (n=40)

Phase Variables	Before implementation of educational program n= 40						FET (P- value)	After one month from implementation of educational program n= 40				FET (P- value)
	Good n=1		Average n= 8		Poor n=31			Good n=35		Average n= 5		
	No.	%	No.	%	No.	%		No.	%	No.	%	
Age (years)							19.355 (0.001**)					23.377 (0.000**)
20 < 30	1	100.0	8	100.0	6	19.3		15	42.9	0	0.0	
30 < 40	0	0.0	0	0.0	22	71.0		20	57.1	2	40.0	
40 < 50	0	0.0	0	0.0	3	9.7		0	0.0	3	60.0	
Level of education							23.551 (0.000**)					5.170 (0.075)
Diploma nursing.	0	0.0	2	25.0	19	61.3		16	45.7	5	100.0	
Technical nursing institute.	0	0.0	6	75.0	11	35.5		17	48.6	0	0.0	
Bachelor degree.	1	100.0	0	0.0	1	3.2	2	5.7	0	0.0		
Current job							8.421 (0.015*)					0.549 (0.459)
Nurse	1	100.0	6	75.0	31	100.0		33	94.3	5	100.0	
Head nurse	0	0.0	2	25.0	0	0.0	2	5.7	0	0.0		
Years of experience							15.270 (0.004*)					0.968 (0.616)
1 < 5	1	100.0	0	0.0	3	9.7		4	11.4	0	0.0	
5 < 10	0	0.0	5	62.5	6	19.3		10	28.6	1	20.0	
≥10	0	0.0	3	37.5	22	71.0	21	60.0	4	80.0		
Attended any training program							20.668 (0.000**)					1.659 (0.198)
Yes	1	100.0	6	75.0	2	6.5		9	25.7	0	0.0	
No	0	0.0	2	25.0	29	93.5	26	74.3	5	100.0		

* A statistically significant difference (P ≤ 0.05)

** A highly statistically significant difference (P ≤ 0.001)

FET: Fisher Exact Test

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Table (3): Relation between the studied nurses' level of total attitude score and general characteristics before and after one from implementation of educational program (n=40)

Variables	Phase		Before implementation of educational program n= 40				FET (P- value)	After one month from implementation of educational program n= 40				FET (P- value)
			Positive n=3		Negative n=37			Positive n=34		Negative n=6		
	No.	%	No.	%	No.	%		No.	%	No.	%	
Age (years)												
20 < 30	3	100.0	12	32.4	6.299 (0.043*)	12	35.3	3	50.0	8.461 (0.015*)		
30 < 40	0	0.0	22	59.5		21	61.8	1	16.7			
40 < 50	0	0.0	3	8.1		1	2.9	2	33.3			
Level of education												
Diploma nursing.	0	0.0	21	56.8	7.356 (0.025*)	15	44.1	6	100.0	6.387 (0.041*)		
Technical nursing institute.	2	66.7	15	40.5		17	50.0	0	0.0			
Bachelor degree.	1	33.3	1	2.7		2	5.9	0	0.0			
Current job												
Nurse	3	100.0	35	94.6	0.171 (0.679)	32	94.1	6	100.0	0.372 (0.542)		
Head nurse	0	0.0	2	5.4		2	5.9	0	0.0			
Years of experience												
1 < 5	2	66.7	2	5.4	11.748 (0.003*)	4	11.8	0	0.0	6.263 (0.044*)		
5 < 10	0	0.0	11	29.7		11	32.4	0	0.0			
≥10	1	33.3	24	64.9		19	55.8	6	100.0			
Attended any training program												
Yes	3	100.0	6	16.2	9.854 (0.002*)	9	26.5	0	0.0	2.149 (0.152)		
No	0	0.0	31	83.8		25	73.5	6	100.0			

* A statistically significant difference (P ≤ 0.05)

** A highly statistically significant difference (P ≤ 0.001)

FET: Fisher Exact Test

Table (4): Correlation coefficient between total knowledge and attitude scores about obstetric triage before and after one month from implementation of educational program (n=40)

Variables		Total knowledge score	
		r	P
Total attitude score	Before program	0.419	0.007**
	After one month of implementation of educational program	0.685	0.000**

** A highly statistically significant difference ($P \leq 0.001$).

Discussion:

Obstetric triage is crucial to research and find various strategies to improve the professional qualities of obstetric triage nurses since nurses are crucial in prioritizing the needs of women who are in urgent need of care and are in critical conditions (Renfro and Wilemon, 2022). Obstetrical triage units face many of the same problems as emergency departments, with overcrowding, prolonged wait times and limited resources. The development of several triage acuity scales in emergency departments has led to standardization of care and better use of resources when determining which women must be assessed urgently and which can safely wait (Elmashad et al., 2020).

As regards general characteristics of the studied nurses, the results of the current study revealed that more than half of studied nurses were aged from $30 < 40$ years with a mean age of 31.92 ± 5.89 .

The results of present study are nearly similar with Engelties et al., (2022) who studied "The role descriptions of triage nurse in emergency unit" on 48 staff nurses and found that the mean age of the studied nurses was 38.42 ± 5.94 years.

Regarding level of education of the studied nurses, the result of the current study showed that more than half of the studied nurses were diploma nursing graduated. This

result is nearly similar to a study conducted by Moirangthem and Devi, (2019) who studied "Knowledge regarding triage system among nursing staff working in selected hospital of Sikkim" the sample size was 25 nurses and found that more than three quarters of the studied nurses were diploma nursing graduates.

On the other hand, the study result was contradicted with Phiri et al, (2020) who studied "Patients' experiences of triage in an emergency department: A phenomenographic study" and found that nurses in the teaching hospital had higher educational qualifications compared to counterparts in the district hospitals. This is may be due to the difference of the study culture.

The result of the current study finding showed that less than two thirds of the studied nurse had ≥ 10 years of experience with mean \pm SD of experience years 11.83 ± 5.57 . This result is disagree with Mohammed et al., (2022), who studied "Effect of Obstetric Triage's Training Program on Nurses' Knowledge and Satisfaction at Obstetrics Emergency's Unit" and report that two fifth of studied nurses had 1 to 5 years of experience, while about one third of them had 11 to 15 years of experience with mean \pm SD of experience years 2.23 ± 1.14 .

Concerning total nurse's knowledge scores regarding obstetric triage, the result of

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the present study showed that the minority of nurses had good knowledge regarding obstetrics obstetrical triage before implementation of the educational program while, the majority of them had good knowledge after one month from implementation of educational program. This result supported the first research hypothesis that stated that nurses will exhibit a positive attitude after implementation of educational program than before. This result could be explained by the positive effect of the educational program. Also, the topic of the study is considered vital and sensitive to their work in such critical unit, so nurses were very interested and satisfied during educational sessions.

This finding is supported by **Mayberger et al., (2022)** who studied that "Implementation of the Maternal Fetal Triage Index to improve obstetric triage" and illustrated that the majority of nurse's had unsatisfactory knowledge among adopted obstetrical triage acuity scale pre educational and training sessions.

The same finding is reported by **Shehab et al., (2019)** who carried out study in Egypt to evaluate "Effect of an educational program regarding patients' triage on nurses" knowledge and skills in the emergency department, and **Mohammed et al., (2022)** who studied "Effect of obstetric triage's training program on nurses' knowledge and satisfaction at obstetrics emergency's unit" and showed the effect of educational program on improving maternity nurses' knowledge regarding obstetric triage.

The study results are agree with **Rebecca and Jariatu, (2020)** who studied "Increase the efficiency and accuracy of obstetric triage, with no published tools existing for low-income settings" and reported a statistically significant difference

between pre and post-test regarding obstetric triage nurses' knowledge ($p < 0.01$).

This result is congruent with **Ali et al., (2022)** who studied "Application of triage protocol to improve quality of care in emergency unit at maternity hospital" and demonstrated that was a significant improvement in nurses' knowledge was observed after the training program ($P < 0.001$).

This result is in the same line with the results of **Abd El-Aty and Osman, (2021)** who investigate "Effects of high fidelity simulation on nursing students' knowledge of obstetrics emergencies, confidence and satisfaction at faculty of nursing Port Said university" and report that the level of knowledge gained after training was higher at the post-program and follow-up assessments than at the pre-program evaluation.

In addition, **Garcia et al., (2018)** who conducted a study to evaluate "Teaching guatemalan traditional birth attendants about obstetrical emergencies at guatemala" including 191 nurses and demonstrated that there was a statistically significant change in knowledge immediately after the training, the mean pretest score was 5.006 ± 0.291 compared to the mean posttest score of 8.549 ± 0.201 ($p = 0.001$).

Pertaining to nurses' attitude toward obstetric triage, the results of the present study illustrated the minority of nurses had positive attitude and the majority of them had negative attitude towards obstetric triage before implementation of the educational program while, the majority of them had positive attitude after one month from implementation of educational program. This result supported the second research hypothesis that stated "Nurses will exhibit a positive attitude after implementation of educational program than before". Also, that there was a highly statistically significant difference in relation to

all items of nurses' attitude about obstetric triage before and after one month from implementation of educational program. This could be explained by the belief that nurses are not authorized to take any triage toward the admitted emergency cases except for helping doctors to take the action and poor knowledge of the studied nurses regarding obstetric triage before implementation of educational program. While the attitude arranged to positive after implementation because good knowledge has positive effect on attitude.

The results of present study are in accordance with **Bakr and Badawi, (2022)** who studied "Effect of educational program on nurses' knowledge, attitudes and practices regarding triage in emergency department in omdurman military hospital, Sudan" and reported that the studied nurses had negative attitude before triage education compared to a significant improvement after triage educational program, with a statistically significant difference among the three-implementation phases (pre, post, and one month follow up).

Additionally, the present study results came in the same harmony with **Hughes, (2022)** who studied "Effectiveness of substance use disorder education on knowledge and attitudes among entry-level obstetric nurses" revealed that there is an improvement in nurses' total attitude immediately, after and at follow up program implementation scores for the majority of them, a 90.0% and 88.0% of studied nurses showed a positive attitude toward triage compared to 20% preprogram implementing with statistically significant differences between the three phases ($P < 0.001$).

The previously mentioned findings are matched with **Marry et al., (2021)** who conducted "Implementation of an obstetric triage decision aid into a maternity assessment unit and emergency department" and showed

that there was an improvement in nurses' total attitude immediately post and one month after from implementation of educational program as the number of nurses with a positive attitude increased with a highly statistically significant difference ($P < 0.001$).

The current study findings are nearly in agreement with **Ruhl et al., (2020)** who conducted a study on "Assessment of knowledge and attitude toward Maternal Fetal Triage" and found that the mean score of attitude before the intervention was 27.9/45 ($SD = 5.14$), after the intervention the mean score became 28.3/45 ($SD = 5.25$) and 28.34/45 ($SD = 5.12$) at immediate post-intervention and 3 months follow up respectively. The difference among the mean scores was significant with time ($P < 0.0001$).

As well as **Richter et al., (2019)** who conducted a study entitled "Implementation of a contemporary model for obstetric triage using AWHONN's Maternal Fetal Triage Index" indicated that there was a significant improvement in total attitude about obstetric triage after intervention. Additionally, there result are nearly consistent with **Du et al., (2022)** who studied "Clinical application of early warning scoring based on BiLSTM-attention in emergency obstetric pre-examination and triage" and concluded that there was significant improvement in all attitude parameters after intervention. The highest percentage of improvement is for health responsibility which changed from 7.5% to 90%.

Concerning the relation between the studied nurses' level of knowledge and general characteristics before and after one month from implementation of educational program, the present study results illustrated that there was a highly statistically significant relation between total nurses' knowledge and age, level of education and attendance of training program before implementation of the

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educational program. Moreover, there was a statistically significant relation between total nurses' knowledge and current job and years of experience before implementation of the program. After one month from implementation of educational program, there was a highly statistically significant relation between total nurses' knowledge and age. Meanwhile, there was no statistically significant relation between total nurses' knowledge and level of educational, attendance of training program, current job years of experience. This may be due to that the level of education improves knowledge and attitude level and with progress of age, nurses become more occupied with the administrative work which effects on level of knowledge and attitude. Therefore, large proportions of nurses didn't familiar about obstetric triage.

The current study results are supported by **Ibrahim et al., (2021)**, who carried out study to "Maximize benefits by prioritizing patients from urgent cases to non-urgent cases" and **Hesham et al., (2021)** who implemented their study in Egypt to "Assess the effect of using the obstetrics triage guideline by the nurse and impact on pregnant women's outcomes" and reported that there was a relationship between total nurses' knowledge regarding obstetric triage, age, educational level and training course attendance.

Furthermore, the present study finding agreed with **Ahmed and Ibrahim, (2022)** who studied "Effects of educational program on maternity nurses' knowledge and practice regarding obstetric triage" reported that there was a relationship between pre-test total knowledge and educational level and training course attendance (p-value 0.05).

On the other hand, **Faheim et al., (2019)**, who showed that no relationship between total nurses' knowledge about patient

triage and educational level and years of experience p- value >0.05.

Concerning the relation between the studied nurses' level of total attitude score and general characteristics before and after one month from implementation of educational program, the current study showed that there was a statistically significant relation between total nurses' attitude and age, level of education, years of experience and attendance of any training program before implementation of educational program. Moreover, there was no statistically significant relation between total nurses' attitude and current job before implementation of the program. After one month from implementation of educational program, there was a statistically significant relation between total nurses' attitude and age, level of education and years of experience. Meanwhile, there was no statistically significant relation between total nurses' attitude current job and attendance of training program. Nurses who were a higher level of education or bachelor's degree showed significantly more positive attitude than those who graduated from diploma. Also, the more years of experience showed more positive attitude than nurses with few years of experience.

These results are in the same line with **Figuroa et al., (2020)** who studied "A prospective study of fetal, neonatal and maternal outcomes in low-middle income countries" and found that there was a positive statistically significant relation between nurses' knowledge and attitude and age and years of experience before and after application of the nursing protocol (p < 0.01). Also, **Daniels and Abuosi, (2020)** who studied "Improving obstetric triage referral systems in low and middle income countries" and found that there was a highly statistically significant relation between total nurses'

attitude and age, educational qualification and years of experience ($p \leq 0.001$).

Concerning correlation between total knowledge and attitude scores regarding obstetric triage before and after one month from implementation of educational program, the present study showed that there was a statistically positive correlation between total knowledge and total attitude scores about obstetric triage before and after one month from implementation of educational program. This result may be due to that the good level of knowledge has positive effect on the level of attitude.

This result is supported by **Shah et al., (2020)** who studied "Efficacy of educational program for nurse midwives to assess high-risk conditions at labor triage in rural Uganda" and found that there was statistically significant correlation between total scores of nurses' knowledge and attitude before and after the application of nursing management protocol ($p < 0.01$). Also, **Choudhary and Surendra, (2018)** who studied "Obstetric triage-time to prioritize emergency" and found that there was highly statistically significant correlation between total nurses' awareness and total nurses' knowledge.

Conclusion:

The implementation of educational program had positive effect on nurses' knowledge and attitude regarding obstetric triage, where there was a highly statistically significant difference in relation to total nurses' knowledge about obstetric triage before and after one month from implementation of educational program. Also, there was a highly statistically significant difference in relation to nurses' attitude about obstetric triage before and after one month from implementation of educational program. Moreover, there was a positive statistically significant correlation between total

knowledge and total attitude scores before and after one month from implementation of educational program. Therefore, the study hypothesis was supported, and the aim of the study was achieved.

Recommendations

- Implementing continuous educational training programs about obstetric triage for maternity nurses should be provided.
- Publication and dissemination of the booklet's obstetric emergency departments at hospitals to enhance nurses' perception about obstetric triage.

Further study needed to be performed:

- Replication of the study on a large probability sample for generalizing the findings.

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تأثير البرنامج التعليمي على إدراك الممرضات تجاه الفرز التوليدي

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يعتبر الفرز التوليدي أحد أهم الإدارة وإتخاذ القرار. فقد يقلل الفرز التوليدي من وفيات الأمهات من خلال توفير الرعاية المناسبة في الوقت والمكان المناسبين للمرأة الحامل عالية الخطورة. لذلك هدفت هذه الدراسة إلى تقييم تأثير البرنامج التعليمي على إدراك الممرضات تجاه الفرز التوليدي. وأجريت هذه الدراسة في قسم طوارئ النساء والتوليد بمستشفى بنها الجامعي. وقد تم أخذ جميع الممرضات الذين عملوا بقسم طوارئ النساء والتوليد بمستشفى بنها الجامعي خلال فترة الدراسة و هم 40 ممرضه. فقد أظهرت نتائج الدراسة أن الأقلية من الممرضات لديهن معلومات جيدة فيما يتعلق بطوارئ النساء والتوليد والفرز التوليدي قبل تطبيق البرنامج التعليمي. بينما كان لدى معظمهن معلومات جيدة بعد شهر واحد من تطبيق البرنامج التعليمي. أظهرت الدراسة أن أقل من عُشر الممرضات كان لهن اتجاها إيجابيا تجاه الفرز عند الولادة قبل تطبيق البرنامج التعليمي. بينما كان لدى معظمهن اتجاها إيجابيا بعد شهر واحد من تطبيق البرنامج التعليمي. بناءً على نتائج هذه الدراسة، يمكن إستنتاج أن تطبيق البرنامج التعليمي كان له تأثير إيجابي على معلومات وإتجاهات الممرضات تجاه الفرز التوليدي، حيث هناك فروق ذو دلالة إحصائية عالية فيما يتعلق بإجمالي معلومات الممرضات حول الفرز التوليدي قبل وبعد شهر واحد من تنفيذ البرنامج التعليمي. أيضاً، كان هناك فروق ذو دلالة إحصائية عالية فيما يتعلق بإتجاهات الممرضات حول الفرز التوليدي قبل وبعد شهر واحد من تنفيذ البرنامج التعليمي. علاوة على ذلك، كانت هناك علاقة إرتباط إيجابية ذات دلالة إحصائية بين مجموع درجات المعلومات والإتجاهات الكليه قبل وبعد شهر من تنفيذ البرنامج التعليمي. لذلك تم دعم فرضيات الدراسة وتم تحقيق هدف الدراسة وقد أوصت الدراسة بتوفير برامج تدريبية مستمرة حول الفرز التوليدي لممرضات الأمومة ونشر وتوزيع كتيبات في أقسام طوارئ النساء والتوليد بالمستشفيات لتعزيز إدراك الممرضات تجاه الفرز التوليدي.