

## Effectiveness of Clinical Pathway Application on Improving Nurses' Knowledge and Practice in Managing Eclamptic Women

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### Abstract

**Background:** Eclampsia proceeds to be a major health problem, particularly in developing countries that, adding significantly to high maternal mortality and morbidity rate. Maternity Clinical Pathways (MCP) is one of the main tools used to manage the quality of health care concerning the standardization of care processes. The implementation of these tools lead to reduce the variability in clinical practice and improves outcomes. **Aim:** The study aimed to evaluate the effectiveness of clinical pathway application on improving nurses' knowledge and practice in managing eclamptic women. **Subjects and Method: Design:** A quasi-experimental design was utilized (one group pretest-posttest and follow up). **Settings:** This study was conducted at gynecology and obstetrics departments affiliated to University Hospital and Shebin El-Kom teaching hospital, Menoufia Governorate, Egypt. **Subjects:** A purposive sample of 60 maternity nurses. **Tools:** Three instruments were used for data collection: A structured interviewing questionnaire, Assessment tool of nurses' knowledge, and an observational checklist to assess maternity nurses' practice regarding care of eclamptic women before and after clinical pathway application. **Results:** The study revealed that there were statistically significant differences before and after implementation of the clinical pathway manifested by higher knowledge and practice score of the maternity nurses. **Recommendations:** Application of the clinical pathway for maternity nurses is very important to improve their knowledge and practice. In addition, facilitations and barriers of the application of clinical pathway should be analyzed to ensure an effective patient outcome.

**Keywords:** Clinical pathway application, Nurses' knowledge, practice, Eclamptic women.

### Introduction

Hypertension is one of the most prevalent disorders occur during pregnancy, which causes complications in 10% of all pregnancies. These disorders are not only dangerous for the pregnant women, but they also significantly increase the risk for the fetus. The hypertensive

disorders in pregnancy classified to five categories: (1) chronic hypertension that is present before pregnancy or starts before twenty weeks' gestation. (2) Gestational hypertension: elevation of blood pressure (140/90 mm Hg) identified after 20 weeks' gestation without

proteinuria. (3) Pre-eclampsia: most common hypertensive disorder of pregnancy, which develops with proteinuria after 20 weeks gestation. It is multi system disease process, which is classified as mild or severe, depending on the severity of the organ dysfunction. (4) Eclampsia: onset of seizure activity in a woman with pre-eclampsia. (5) Chronic hypertension with superimposed preeclampsia: occurs in approximately 20% of pregnant women with increased maternal and fetal morbidity rates <sup>(1)</sup>.

Eclampsia, which is considered a complication of severe preeclampsia and commonly defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of preeclampsia. It typically occurs during or after the 20th week of gestation or in the postpartum period <sup>(2)</sup>.

Eclampsia remains to be the most important cause of morbidity and mortality rate among either maternal or fetal world or among mothers and fetuses. Therefore, enhancing knowledge about management of eclampsia among health team is very important, as it will decrease disease and death rate among women with eclampsia. Nurses have a vital role in preventing maternal mortality because of eclampsia. Hence, the value of estimating nurses' knowledge about eclampsia <sup>(3)</sup>.

A clinical pathway, also known as care pathway. The clinical pathways were introduced in the early 1990s in the United Kingdom (UK) and the United States of America (USA) and are being increasingly used throughout the developed world. A clinical pathway is one of the main tools used to manage the quality in health care concerning the standardization of care processes and their implementation reduces the variability in clinical practice and improves outcomes. Clinical pathways are structured, multidisciplinary plans of care designed to

support the implementation of clinical guidelines and protocols. Clinical pathways aim for greater standardization of treatment regimens and sequencing as well as improved outcomes, from both a quality of life and a clinical outcomes perspective <sup>(4)</sup>.

The eclamptic nursing care pathway has been developed to facilitate the assessment and documentation of pertinent information about mothers in a structured, logical and standardized manner <sup>[5]</sup>. The primary responsibilities of the nurses during pregnancy are to assess the women, provide care, teach and report any significant findings. Maternity nurses are essentially detectives searching for findings that might lead to negative outcomes for patients if left unattended. Thus, it is imperative for the nurses to distinguish between normal and abnormal findings and to have a clear understanding of the nursing care necessary to promote patients' health and well-being <sup>(5)</sup>.

As health-care provider, nurses are responsible about diagnosis and eclampsia management, so increasing nursing skills to prevent, identify, and manage complications of pregnancies especially preeclampsia and eclampsia led to reduce maternal and fetal mortalities rate. Increase nursing education and abilities to do decisions would improve their performances <sup>(6)</sup>.

#### **Significance of the study:**

There are limited data on eclamptic clinical care pathway. Clinical pathways optimize the clinical outcomes whilst maximizing clinical efficiency. It represents a new approach to patient care, fulfilling many of the demands of clinical practice and its improvement. Eclamptic clinical care pathway provides a guide for evidence-based obstetric nursing care that improves quality of obstetric care and reduce maternal and neonatal complications and mortality <sup>(7)</sup>.

The pregnant women expect that their labor and obstetric staff have been prepared for dealing with complications and emergencies so, they trust that the hospital will use everything available to ensure the best possible outcomes. In Egypt, maternal mortality ratio was 45/100000 live births (World Health Organization), (4.2%) had pregnancy-induced hypertension, (3.8 %) eclampsia<sup>(8)</sup>.

The World Health Organization (WHO) reported that hypertension disorders during pregnancy and its complication has caused up to 14% of the global maternal deaths, or more than 70,000 cases per year and almost of them occur in developing countries<sup>(9)</sup>. Eclampsia affects about (5- 8%) of all pregnancies, the recent report of the World Health Organization (WHO) shows that statistics suggest 76,000 maternal mortality and morbidity annually worldwide and about 500,000 child deaths due to preeclampsia and eclampsia<sup>(10)</sup>. To minimize mortality and morbidity, it is important to identify cases of pregnancy-induced hypertension, to provide efficient and effective nursing care to them. As part of the sustainable development goals, the aim between 2016 and 2030 is to reduce the global maternal mortality ratio to less than 70 per 100,000 live births<sup>(11)</sup>.

Despite the importance of clinical pathway especially during pregnancy period, limited studies have done regarding the impact of clinical pathway application on women during pregnancy period, so it is found that it may be helpful to implement clinical pathway to improve nurses' knowledge and practice in managing eclamptic women. Therefore, the researchers tried to fill in such a spot of data by conducting this study.

#### **Definitions:**

**Clinical pathway theoretically defined** as way of setting out a process of best practice to be followed in the treatment of a patient or client with a particular condition or with particular needs. In addition, it is defined as a

multidisciplinary management tool based on an evidence-based practice for a specific group of patients with a predictable clinical course, in which the different tasks (interventions) by the professionals involved in the patient care, which are defined, optimized and sequenced and outcomes are tied to specific interventions<sup>(12)</sup>.

**A clinical pathway operationally defined** as a care plan in which an intervention, which based on best practice, took place (detailed instruction of the best practice on nursing intervention given to the maternity nurses; assessment of women and her newborn, application of nursing procedure and providing education) with monitoring outcomes<sup>(13)</sup>.

#### **Aim of Study**

The aim of this study was to evaluate the effectiveness of clinical pathway application on improving nurses' knowledge and practice in managing eclamptic women.

#### **Research Hypotheses:**

Maternity nurses' knowledge and practice will be improved after implementing clinical pathway regarding management of eclampsia.

#### **Subjects and Method**

#### **Research Design:**

A quasi-experimental design (pre-posttest and follow up for maternity nurses) was utilized in this study.

#### **Research Settings:**

This study was conducted at gynecology and obstetrics departments affiliated to University Hospital and Shebin El-Kom Teaching Hospital, Menoufia Governorate, Egypt.

#### **Subjects:**

A purposive sample of 60 maternity nurses worked in the previous settings. **Inclusion criteria:** All nurses were working at

University Hospital and Shebin El-Kom Teaching Hospital in antenatal, labor, and intensive care units. **Exclusion criteria:** Nurses who have administrative role only as head nurse and refuse to participate in the study.

**Data collection instruments:**

Data collected through using the following instruments:

**Instrument (1):** A structured interviewing questionnaire related to the maternity nurses; the researchers developed it after reviewing of the related literature; it divided into two parts:

**Part 1:** Socio-demographic characteristics of the sample such as (personal characteristics, age, education, training courses for eclampsia, source of information about eclampsia, etc.) it contained (8) questions.

**Part 2:** Likert scale to assess knowledge of the maternity nurses regarding eclamptic clinical care pathway. It contained questions about eclamptic clinical care pathway, such as definition, importance, component of eclamptic clinical pathway and nurse’s role in eclamptic clinical pathway application.

**Scoring system:**

Score	Maternity nurses’ knowledge regard eclamptic clinical care pathway.
1	Correct answers
0	Incorrect answers

**Instrument (2):** Assessment tool of nurse’s knowledge regarding eclampsia and its nursing management, through items written in simple Arabic language. The researchers developed it after reviewing of the related literature. It included questions to assess level of nurses’ knowledge about eclampsia and the management of eclamptic women. It included (18) items in the forms of multiple choice and

open-ended questions such as (definition, causes, signs and symptoms, complications of eclampsia, immediate management during fit, cares of women after convulsion, and prevention of drug toxicity...etc.

**Scoring system:**

percentage	Maternity nurses’ knowledge regarding eclamptic Clinical care pathway.
0-49%	Poor
50-69%	Average
≥70%	Good

A total scoring was modified after being revised by researchers to reference updated Ministry of Health and Social Welfare MOHSW (2010) which show a competent maternity nurse should obtain satisfactory pass score in knowledge and skill ≥70 %.

**Instrument (3):** An observational checklist to assess maternity nurses’ practice regarding care of eclamptic women before and after the clinical pathway application, the researchers developed it after reviewing of related literature, the questionnaire developed from checklist for eclamptic care by Jhpiego, 2011<sup>(14)</sup> and Aba-Banda 2010<sup>(15)</sup> in collaboration with the ministry of health. Tools formulated in English and translated into Arabic by the researchers. It consisted of (33) items related to nurses' practice.

Score	Nurses' practice regarding eclamptic care before and after clinical pathway application
0-59%	Poor
60-74%	Average
≥75%	Good

**Method:**

**Validity and Reliability:**

The instruments were reviewed and tested for content validity by five experts in the obstetrical nursing; modifications were done accordingly to ascertain relevance and completeness. Test-retest reliability was used. The internal consistency of reliability for tool 1 was tested using  $\alpha$ -Cronbach-coefficient test and it was 0.78, which was reliable. Regarding tool 2, equivalence was measured by using interrater reliability, which revealed 0.82.

#### **Administrative design:**

An official letter requesting permission to conduct the study was obtained before embarking the study from the Dean of the Faculty of Nursing, Menoufia University to the Directors of each study setting. This letter was included the aim of the study in order to get the permission and help for collection of data.

#### **Ethical considerations:**

According to the Faculty of Nursing Ethical Research Committee, the researchers got the maternity nurses and women consent before conducting the study. Assured them about confidentiality, safety and privacy of data obtained.

#### **A pilot study:**

After developing the tool, a pilot study was carried out on 10% of the total sample, size (6) nurses were randomly chosen. The individuals who participated in the pilot study were excluded from the sample. The aim of the pilot study was to test the feasibility and clarity of the tool and to estimate the time required to fill in the questionnaire.

#### **Procedure for Data Collection:**

The researchers reviewed the current local and international related literature to be more acquainted with the problem, to design the study instruments, and to finalize them by

using books, articles, magazines and internet. The actual fieldwork was carried out from beginning of March 2021 up to the end of August 2021. The researchers were available in the study settings three days/week, at the morning shift from 8.00 Am to 2.00 Pm. The researchers introduced themselves to the medical and nursing staff members in the previously mentioned settings. The researchers explained the nature and the purpose of the study and asked for cooperation.

#### **The researchers performed the research in the following phases:**

##### **Interviewing and assessment phase:**

- At the beginning of the interview, the researcher introduced herself and utilizing proper channel of communication with each nurse. All nurses interviewed, our purposes were explained, and a written consent was taken from them to participate in the study.
- The researchers met each maternity nurse collected their socio-demographic data and assessed their knowledge level and practice of eclamptic clinical pathway steps before the intervention through pre-test questionnaire. This phase took nearly 15-25 minutes.

##### **Planning phase:**

- The researchers prepared educational materials about eclamptic clinical pathways included: definitions, importance, components, and nursing role.

##### **Clinical pathway included:**

- The researchers developed the clinical pathway design covering the phases of care introduced to the maternity nurses. It included immediate management during fits and care of women after the convulsion.

### **Implementation phase:**

- The researchers provided two educational sessions (each session took 30 minutes) about eclamptic clinical pathways for maternity nurses using booklet included: definitions, importance, components and nurses role.

- The researchers explained the clinical pathway systematically assisted by using educational videos as the teaching methods via sessions; each session include five maternity nurses as those responsible for providing care to pregnant women with eclampsia.

- Beside that, each nurse received brochure with the information needed to facilitate the learning and its application in order to improve knowledge and practice.

-The researchers applied eclamptic clinical pathway on the same studied maternity nurses in six sessions where four and two of them were devoted to theoretical and practical content to cover all information related to eclamptic women. Sessions were arranged to take place when nurses working during morning shift would be available. The **first session**, an orientation to the program, its purpose, and the written manual of regarding care of eclamptic women took place. Nurses were informed about the time of sessions.

The **second session** to fourth session applied to cover all information related to nurses knowledge regarding care of eclamptic women, such as on immediate management during fits, the cares of women after convulsion, physical examination

needed after convulsion, the recommended drugs used to control convulsion in management of eclampsia, and the recommended dose of that drugs during control of convulsion. As a part of clinical pathway application, the fifth session to sixth session covered all information and practice regarding care of eclamptic women, such as encourages the woman to lie on her side, if available, gives oxygen at 4–6 L per minute by mask or cannula, checks the biceps or patellar reflexes, withholds fluids.

### **Evaluation and follow-up phase:**

- The researchers evaluated the level of maternity nurses' knowledge and practice post clinical pathway application. In addition, after four weeks of implementation, the follow-up test for nurses' knowledge and practice were done by the same format of the pre-training assessment.

### **Data Analysis:**

Statistical analysis was done by using Statistical Package for the Social Science (SPSS 20.0). Quality control was done at the stages of coding and data entry. Data were presented by using descriptive statistics in the form of frequencies and percentage for qualitative variables and mean and standard deviation (SD) for quantitative variable. Fisher's exact test used to test the association between two qualitative variables or to detect differences between two or more proportions statistical significance was considered at  $P \leq 0.05$ .

## Results

**Table (1):** represented distribution of the maternity nurses according to their socio-demographic characteristics. As inferred from the table, the mean age of the maternity nurses' aged  $30.5 \pm 7.2$  and 50% had a Bachelor's degree in nursing education. Regarding years of experience, near half of study sample 41.7% had 10 years' of experience, while 31.7% had 5 – 10 years of experience. Half of nurses 50 % not had a general idea about eclampsia while 70% of them had source of information from work experience. In addition, none of them had received any training workshops related to eclamptic clinical pathway (100%).

**Table (2):** showed an improvement in the nurses' knowledge regarding all items of eclamptic clinical pathway (definition, importance, components, nursing role) in the post application and in the follow-up than before the application which is statistically significant ( $p=.000$ ). As inferred from the table higher percentages of nurses answered correctly all items post intervention (95%, 93%, 96% & 96% respectively) and (91%, 93%, 95% & 95% respectively) in the follow-up (three weeks post application).

**Figure (1):** displayed an increase in the total nurses' knowledge score regarding

eclamptic clinical pathway after the intervention than before the intervention as 99% of the maternity nurses had satisfactory knowledge after the intervention compared to 0% before the intervention and 98% in the follow-up.

**Table (3):** showed that the highest percentages of nurse's knowledge after clinical pathway application and in the follow-up (98%, 95%, 96%, 96% & 95%, 93%, 93%, 95% respectively) than pre-clinical pathway application (8%, 3%, 3% & 6%, respectively).

**Table (4):** indicates that, there was statistically significant difference before, after and in the follow-up regarding all items of the knowledge with increased knowledge of nurses after clinical pathway application relation to nurses knowledge regarding care of eclampsia before clinical pathway application ( $p=.000$ ).

**Table (5):** illustrates that, there was statistically significant difference before, after and in the follow-up related to clinical pathway application to monitor women with Eclampsia ( $p<.000$ ).

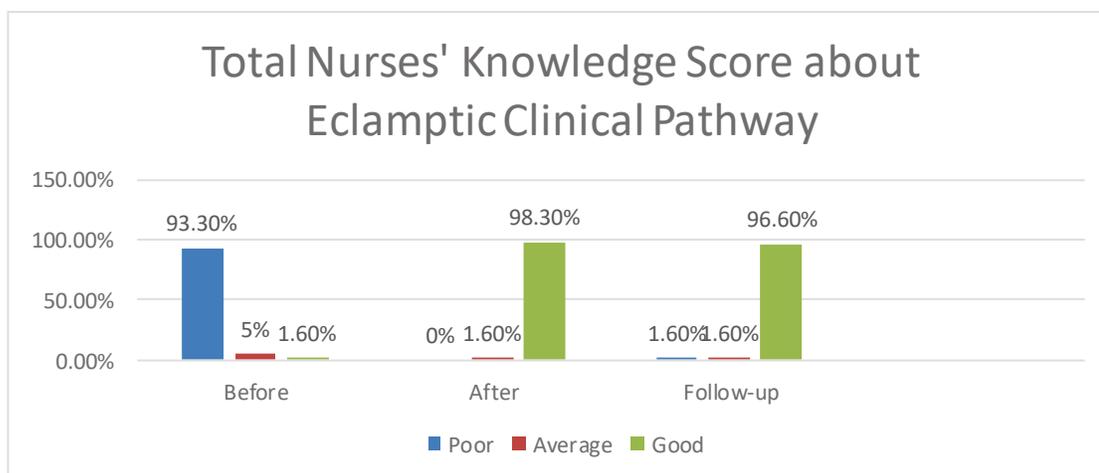
**Figure (2):** showed that 97% of the nurses had a good practice regarding care of women with eclampsia after pathway application compared to 12% before clinical pathway application.

**Table (1): Distribution of maternity nurses according to their socio-demographic characteristics**

Variables	The Study Nurses	
	No	%
<b>Age groups</b>	Mean ± SD 30.5 ± 7.2	
<b>Educational level</b>		
Nursing secondary school	19	31.7
Technical nursing education	11	18.3
Bachelor of nursing	30	50
<b>Job position</b>		
Staff Nurse	<b>55</b>	91.7
Supervisor Nurse	<b>5</b>	8.3
<b>Years of experience</b>		
< 5years	16	26.6
5-10 years	19	31.7
More than 10 years	25	41.7
<b>General information about eclampsia</b>		
Yes	30	50
No	30	50
<b>Source of Information (N=30)</b>		
Studying	9	30
Work experience	21	70
<b>Training workshops related to eclamptic clinical pathway</b>		
Yes	0	0
No	60	100

**Table (2): Maternity Nurses' knowledge about eclamptic clinical pathway Pre, Post and follow-up Application**

Variable	Pre		Post		Follow-up (4weeks)		X <sup>2</sup>	P-Value
	No	%	No	%	No	%		
<b>Definition of eclamptic clinical pathway</b>								
Correct	0	0	57	95	55	91.7	58.66	.000
Incorrect	0	0	2	3.3	2	3.3		
Don't know	60	60	1	1.7	3	5		
<b>Importance of eclamptic clinical pathway in maternity nursing</b>								
Correct	0	0	56	93.3	56	93.3	95.00	.000
Incorrect	0	0	1	1.7	1	1.7		
Don't know	60	60	3	5	3	5		
<b>Components of eclamptic clinical pathway</b>								
Correct	0	0	58	96.6	57	95	99.98	.000
Incorrect	1	1.7	1	1.7	2	3.3		
Don't know	59	98.3	1	1.7	1	1.7		
<b>Nurses' role in eclamptic clinical pathway application</b>								
Correct	0	0	58	96.6	57	95	99.98	.000
Incorrect	0	0	1	1.7	2	3.3		
Don't know	60	60	1	1.7	1	1.7		



**Figure (1): Nurses Total Knowledge Scores before, after and follow-up regarding Eclamptic Clinical Pathway.**

**Table (3): Nurses' Knowledge Related to Eclampsia before, after and follow-up Clinical Pathway Application**

Nurses' knowledge	Before		After		Follow-up (4weeks)		x2	P-Value
	No	%	No	%	No	%		
Definition	5	8.3	59	98.3	57	95	77.56	.000
Causes	2	3.3	57	95	56	93.3	71.01	.000
Signs and symptoms	2	3.3	58	96.7	56	93.3	72.01	.000
Complications	4	6.6	59	96.7	57	95	75.43	.000

**Table (4): Frequency Distribution of Nurses' Knowledge Regarding Management of Eclampsia (before, after and Follow-up) Clinical Pathway Application**

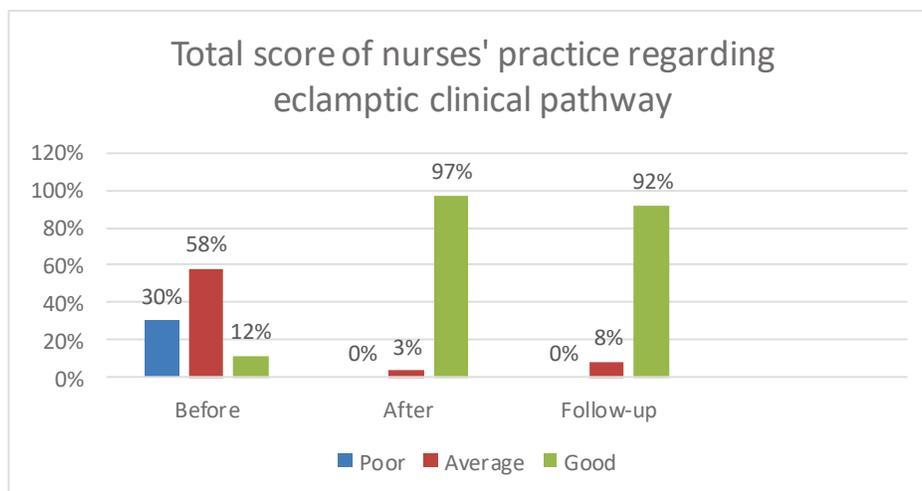
Nurses' knowledge	Before		After		Follow-up (4weeks)		x2	P-Value
	No	%	No	%	No	%		
The immediate managements during fit	14	23.3	58	96.7	55	91.7	44.13	.000
Kind of assessment/physical examination needed after convulsions/fits	17	28.3	56	93.3	54	90	42.11	.000
Recommended intravenous line for managing eclampsia	15	25	59	98.3	56	93.3	40.16	.000

Recommended drug used to control convulsion in management of eclampsia	16	26.6	60	100	57	95	39.07	.000
Recommended dose of drug during control of convulsion	13	21.7	59	98.3	56	93.3	43.12	.000
Prevention of drug toxicity	15	25	60	99	57	95	40.16	.000
Antidote used for management of drug toxicity	17	28.3	59	98.3	55	91.7	42.27	.000
Immediate measures in case the toxicity of the drug occur	17	28.3	59	98.3	57	95	42.89	.000
Recommended group of drug used if diastolic blood pressure remains above 110mmhg,	16	26.6	58	96.7	56	93.3	40.27	.000
Monitoring fetal heart rate	15	25	59	98.3	57	95	40.28	.000
Cares of women after convulsion	17	28.3	58	96.7	57	95	42.66	.000
Other management of eclampsia	15	25	59	98.3	56	93.3	40.36	.000
Barriers in the management of women with eclampsia	16	26.6	58	96.7	56	93.3	40.77	.000
Nurses suggestion for improving management of eclampsia	15	25	59	98.3	57	95	40.44	.000

**Table (5): Frequency Distribution of Nurses’ Practice Regarding Management of Eclampsia (before, after and Follow-up) Clinical Pathway Application**

Nurses’ practice	Before		After		Follow-up (4weeks)		x2	P-Value
	No	%	No	%	No	%		
Call obstetric team	45	75	60	100	57	95	53.24	.000
Prepare bed with padded side rails	50	83.3	58	96.7	57	95	57.12	
Ensure safe environment and put the women in lateral position	49	81.7	57	95	55	91.7	49.77	.000
Ensures the woman’s airway is open	50	83.3	58	96.7	56	93.3	55.43	.000
Observes color	48	80	59	98.3	57	95	54.37	.000
Give oxygen by face mask	44	73.3	58	96.7	56	93.3	54.35	.000
Checks respirations	43	71.7	60	100	56	93.3	58.25	.000

Checks pulse	43	71.7	60	100	56	93.3	58.25	.000
Checks temperature	42	70	60	100	56	93.3	58.25	.000
Checks fetal heart	45	75	60	100	56	93.3	56.13	.000
Checks the biceps or patellar reflexes	30	50	59	98.3	56	93.3	58.01	.000
Starts an intravenous drip of normal saline or Ringer's lactate	40	66.7	60	100	55	91.7	48.89	.000
Gives antihypertensive drugs if diastolic blood pressure remains above 110 mm Hg.	41	68.3	59	98.3	57	91.7	50.48	.000
Gives anti-convulsive drugs to prevent or treat convulsions / fits	39	65	59	98.3	55	91.7	50.67	.000
Insert indwelling catheter and start hourly urine measurements	39	65	58	96.7	56	93.3	50.09	.000
Checks urinary output	39	65	58	96.7	56	93.3	50.09	.000
Commence a chart for hourly observation of blood pressure, pulse, oxygen saturation, urine output, fluid input (IV and oral)	40	66.7	58	96.7	55	91.7	52.44	.000
Send bloods for investigation, checks urine for proteinuria	42	70	60	100	57	95	50.69	.000
Assesses clotting status with a bedside clotting test	40	66.7	57	95	55	91.7	51.16	.000
If the woman begins having a convulsion, provides for care during the convulsion	42	70	59	98.3	56	93.3	50.98	.000
Never leaves the woman alone	49	81.7	60	100	56	93.3	55.19	.000
Checks for signs of labor	38	63.3	59	98.3	56	93.3	55.13	.000
Review laboratory results	40	66.7	59	98.3	55	91.7	51.26	.000
Records drug administered, interventions, and findings on the woman's record	42	70	60	100	57	95	50.69	.000



**Figure (2): Total Score of Nurses Practice before, after and Follow-up regarding Eclamptic Clinical Pathway**

### Discussion

Eclampsia remains to be the most important cause for morbidity and mortality rate among conditions or world maternal and fetal. Therefore, enhancing knowledge about management of eclampsia among health team is very important, as it will decrease disease and death rate among women with eclampsia. Nurses have a vital role in preventing maternal mortality because of eclampsia Chowdhury et al. (2019) <sup>(16)</sup>.

Clinical pathway maintains the continuity of care providers by promoting consistencies in assessment and documentation, thereby reducing the variation in practice. It provides the nurse, caring for the mother with evidence-based knowledge and references related to expected normal assessment findings and care practices that signal mother readiness for discharge. Variances from the expected normal serve as key decision points for the nurse related to care options and interventions El Baz (2018) <sup>(17)</sup>. This study aimed to evaluate the effectiveness of clinical pathway application on improving nurses' knowledge and practice in managing eclamptic women.

Regarding the socio-demographic characteristics of the nurses, the study findings revealed that, the mean age of the study nurses was  $30.5 \pm 7.2$  years old. The results of the present study come in the same line with the findings mentioned by Kim et al. (2017) <sup>(18)</sup> who studied the effectiveness of clinical pathway in the prevention and management of severe preeclampsia/ eclampsia and mentioned that most participants mean age of them were from  $31.2 \pm 6.5$  years old. Also, Maembe (2018) <sup>(19)</sup>, did a study on management of pre-eclampsia and eclampsia in Dar-el-Salaam public health facility and found nearly two thirds of health care workers were between thirty-one to thirty-nine.

As regard years of experience, near half of study sample had ten years of experience, while one third of them had five to ten years. This result is in agreement and supported by the work of the Esther and Aba Banda (2016) <sup>(20)</sup>, who found that slightly above half of the respondents had worked for ten years while forty eight percent of respondents had worked for over eleven years and above. This

indicated that more nurses working in this hospital have years of experience's less than ten years.

The findings of the current study verifying the hypotheses and showed that there was a statistically significant improvement in nurses' knowledge and practice regarding all items for eclamptic clinical pathway care after application. This improvement in nursing care was reflected on knowledge and practice during the follow-up (four weeks) after eclamptic clinical pathway application.

Concerning to nurses' knowledge about the clinical pathway, the study results revealed that there was statistically a significant improvement in nurses' mean score of knowledge regarding; the eclamptic clinical pathway, also there were statistically significant difference in the total score of knowledge from pre to post and follow-up (four weeks) after application of clinical pathway. This result could be due to the effect of clinical pathway application that given to nurses in the present study. This result was in the same line with El-Razek (2018) <sup>(21)</sup> who reported that in their study clinical pathway application program was effective in improving the level of knowledge of maternity nurses on the management eclamptic mothers and the difference between pre and posttest scores was highly significant at p-value < .05 level

In relation to nurses' knowledge and practice, regarding eclamptic clinical care pathway the present study findings revealed that, there was a significant improvement in nurses' knowledge regarding all items as (definition, importance, components, and nursing role) at post application than pre application. This reflected the success of the study in teaching maternity nurses all items of clinical pathway. The current study findings comes in agreement with Safwat, and Khorais (2019) <sup>(22)</sup>, who was studied the outcomes of clinical pathway in management of

eclampsia and found that it's very important for the nurses to become oriented with eclamptic clinical pathway where clinical pathways are one of the main tools used to manage the quality in health care concerning the standardization of care processes and their implementation reduces the variability in clinical practice, less complication and improves outcomes.

As regards the total knowledge of nurses immediately after clinical pathway application and after four weeks follow up regarding definition of eclampsia, causes, signs, symptoms and complication the present study findings revealed that significant improvement in total knowledge. This finding is in congruent with the study findings of DiptiShukla (2016) <sup>(23)</sup> the findings of the present study reported that, knowledge is a key factor in the performance of clinical pathway. The implication of nursing education offers nurses a chance to best practice of the clinical pathway. Moreover, Bell (2018) <sup>(24)</sup> supported these results and found that, clinical pathway application is very effective method to increase nurse's knowledge and practice. This finding is in accordance with Schriefer (2019) <sup>(25)</sup> who reported that, none of the nurses had adequate performance of any tasks of the clinical pathway; it is most certainly due to poor knowledge regarding these tasks.

The current study displayed that there was an improvement of nurses' practice regarding management of eclampsia immediately after clinical pathway application and after four weeks, where before application, more than half of nurses have average practice and less than quarter of them had a good practice. This may be due to paucity of cases and lack of experience of studied nurses. This result is in agreement with Siddig (2016) <sup>(26)</sup> who found that, before the intervention of eclamptic clinical care pathway, less than majority of nurses had poor and average practice while after

the intervention the majority of nurses had good practice.

In addition to Mitchell (2017) <sup>(27)</sup> reported that clinical pathway teaching and training courses for nurses provide effective and highly efficient teaching and training pattern for nurses in clinical designing of clinical pathway practice. This result was in the same line with Roth et al. (2016) <sup>(28)</sup> who reported that nurses have a key role in all aspects of clinical pathway practice because they start and end the chain of staff involved in care of patients.

Moreover Mumtaz et al. (2017) <sup>(29)</sup> reported that, the performance of the clinical pathway by nurses was monitored during care of patients, overall, only about one-third of the nurses were applied the pathway correctly. The poor application of the pathway steps for reasons beyond the responsibility of the nurse not counted as incorrect application. On the other hand Shah et al. (2018) <sup>(30)</sup> found that in his study a clear improvement in practice scores among nurses immediately post nursing clinical pathway implementation than pre-nursing clinical pathway implementation. Our results in agreement with Gopi and Rahul (2019) <sup>(31)</sup> who reported the high significant relation were observed after clinical pathway application than before application and four weeks following application.

### **Conclusion**

Based on the findings of the present study and research hypotheses, the study concluded that: implementation of clinical pathways showed an improvement in the maternity nurses' knowledge regarding all items of eclamptic clinical pathway (definition, importance, components and nursing role) after the intervention and in the follow-up (four weeks) after application than before application which is statistically significant ( $p=.000$ ). In addition, there was an increase in the total score of nurses' knowledge and practice

regarding the eclamptic clinical pathway after application and in the follow-up than before application as 98.3% of the maternity nurses had good knowledge and practice after the application compared to 1.6% before the application.

### **Recommendations**

From this study, we can recommend to:

- Application of the clinical pathway for maternity nurses to improve their knowledge and practice through continuing health educational programs, seminars and in service training.
- Clinical pathway should be applied as a routine nursing care in the hospitals to caring for women with eclampsia and preeclampsia to reduce the maternal and fetal complications among women with preeclampsia.
- Further studies should be conducted to apply and demonstrate the research on a larger population for generalization of the result.

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