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## Effect of Emergent Nursing Educational Program on Nurses' Performance for Patients with acute poisoning

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### Abstract

**Background:** Acute poisoning is a major health problem leading to emergency department admission and inducing significant patient morbidity and mortality throughout worldwide. Nurse's performance play an important role in the management of acute poisonings. **Aim of the study:** Determine the effect of emergent nursing educational program on nurses' performance for patients with acute poisoning. **Design:** A quasi- experimental design was utilized in this study. **Subjects and method:** Data were collected from all nurses (27) nurses from Tanta University Poisoning Control Center and (10) nurses from Elmanshawy General Hospital) affiliated to ministry of health. **Tools:** Two tools were used to collect data: **Tool (I);** Nurses' Structured Interview Scheduled Sheet part one: socio-demographic characteristics of nurses, part two: structured nurses' knowledge interview questionnaire, **Tool (II);** nurses' observational checklist about emergent nursing intervention of acutely poisoning patient. **Results:** the present study revealed that there was a significant improvement in the mean scores of the total level of knowledge and practice immediately and one-month post program implementation in both studied groups at  $P < 0.05$  with only significant difference between the two groups in pre-program implementation regarding total practice at  $P < 0.05$ . **Conclusion:** The study findings revealed that nurses' performance of emergent intervention for patient with acute poisoning was improved after application of educational program. **Recommendation:** It is recommended to distribute guideline booklet with knowledge and practices about emergent intervention for poisoning and provide continuous in-service educational program to nurses working in poisoning centers.

**Key words:** Acute poisoning, Emergent educational nursing program, Nurses performance.

## Introduction

Acute poisoning is a global problem that has constantly increased over the last few years and is a major cause of morbidity and mortality all over the world <sup>(1)</sup>. It is a common problem in the emergency departments; those patients are rushing to the hospital at the earliest possible moment, irrespective of the amount and nature of the poison. This requires accident and emergency team to have knowledge, skills and positive self-esteem to perform critical assessment and emergent care to ensure an optimal patient outcome <sup>(2)</sup>.

Globally acute unintentional poisonings represent about 2- 3 million cases in 2012 resulting in 1,93,460 deaths, while the intentional poisonings about 2 million cases resulting in about million people die each year this is according to world health organization (WHO) statistics, and estimated that about 84% of deaths occurred in low- and middle-income countries <sup>(3,4)</sup>. Updated Global Burden of Disease 2015 estimated that approximately 86,353 people died from unintentional poisonings worldwide in 2015, with 78,054 (90%) deaths occurring in low- and middle-income countries <sup>(5)</sup>.

Although the epidemiology of poisoning in Egypt is difficult to be established, a statistical record at Tanta University

Hospitals indicated that the number of patients with acute poisoning admitted to the poisoning control center in 2019 was 2793 patients <sup>(6)</sup>. In addition a statistical record at Elmanshawy General Hospital indicated that the number of patients with acute poisoning in 2019 was 2033 patients<sup>(7)</sup>.

Poison is a substance capable of producing harm or dysfunction when entering the body through ingestion, inhalation, and injection as intravenous or dermal route in the body by its chemical activity which produce general or local effects <sup>(8)</sup>. This effects on multiple body systems and symptoms are frequently numerous and non-specific. Some of the signs and symptoms include cerebral and neuromuscular features such as staggering and dizziness, coma, convulsions, delirium and hallucination <sup>(9)</sup>.

The accident and emergency nurse is considered as the first member who deals with acutely poisoned patient. So, she should be aware for using universal measures to protect herself during management of patients with acute poisoning, followed by emergent intervention which is a consequence of resuscitation and stabilization, assist in toxic diagnosis, therapeutic interventions such as decontamination, enhanced

elimination of absorbed toxins and antidotes. Finally, supportive care and psychosocial interventions must be performed for acutely poisoned patients<sup>(10)</sup>.

Initially, the nurses should follow a resuscitation of airway, breathing, circulation and disability approach (ABCD) to maintain a protected airway, adequate ventilation and hemodynamic stability. During initial stabilization nurses are responsible for taking proper history as early as possible to obtain data about the nature of the poisonous substance, the degree of exposure and the time since exposure through asking the patient, relatives, accompanies or obtaining sample from poisonous substances and perform detailed physical examination<sup>(11)</sup>.

Through identifying the toxic substances, the nurse should assist in decontamination procedures such as terminating by removal of clothes ,from the affected areas then rinse and irrigation with normal saline or tap water is importance and should be initiated as soon as possible<sup>(10)</sup>. During patient exposure to ingested toxic substances the nurse is responsible for decreasing exposure to toxic substances by assist in performing emesis, gastric lavage, giving multi-dose activated charcoal and whole bowel irrigation,urine alkalinization and extracorporeal elimination as order<sup>(12)</sup>.

Finally, the nurse is responsible for providing supportive care which include assessing and controlling Vital signs, Fluid and Electrolytes, acid-base status, monitor and treat secondary complications results from delayed effects of poisoning, follow up for end organ damage and psychosocial and workplace safety interventions<sup>(12)</sup>.

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

Acute poisoning is a global health problem that getting worse throughout the world because the development of new chemicals and drugs, leading to increase morbidity and mortality<sup>(13,14)</sup>. Nurses play a core role in emergency department to deal with acute poisoning patient. There are many studies used to assess nurse's performance toward emergent care of acute poisoning and revealed that nurse's improper performance regarding emergent intervention for acute poisoning. In Tanta, there is a lack of studies to improve nursing performance about acute poisoning. Hence there is an urgent need to design program for nursing care to improve knowledge and skills of management of patient with acute poisoning.

**Aim of the study:**

Determine the effect of emergent nursing educational program on nurses' performance for patients with acute poisoning.

**Research Hypothesis:**

Nurse's performance is expected to be improved post implementing emergent nursing educational program for patients who have acute poisoning.

**Subjects and Method:****Study design:**

A quasi- experimental design was utilized in this study.

**Study setting:**

The study was conducted at Tanta University Poisoning Control Center (T.U.P.C.C) which accommodates of (10 beds) at Emergency Hospital affiliated to Tanta University Hospitals. Tanta City, Egypt. and Elmanshawy General Hospital Emergency Department (E.G.H.E.D) (6 beds) affiliated to Ministry of Health, Tanta City, Egypt.

**Subjects:**

All nurses who were working in the previous mentioned setting (27 nurses from Tanta University Poisoning Control Center and 10 nurses from Elmanshawy General Hospital) who were involved directly in immediate care of acutely poisoning

patients regardless of their age, sex, years of experience, level of education and residence.

**Tools of the study:**

Two tools were used for data collection. These tools were aimed to determine the effect of emergent nursing educational program on nurses' performance for patients with acute poisoning.

**Tool I: Nurses' Structured Interview**

**Scheduled Sheet:** This tool was developed by researcher after reviewing relevant literature <sup>(15-23)</sup> to collect baseline data pertinent to the current study. It consisted of two parts as follows:

**Part one:** Socio-demographic characteristics of nurses, to assess data relate to age, sex, marital status, level of education, total years of experience in previous mentioned department, previous and current training program on acute poisoning and previous lectures regarding poisoning during undergraduate study.

**Part two:** Structured nurses' knowledge interview questionnaire: This part was used to assess nurse's knowledge related to acute poisoning. It included

- a) **Knowledge regarding acute poisoning:** Such as definition, classifications, causes of acute

poisoning and clinical manifestations, which consisted of 6 items.

- b) **Knowledge related to emergent nursing intervention:** It includes airway management, breathing, maintenance of circulation and neurological assessment, which consisted of 11 items.
- c) **Knowledge regarding diagnosis of poison, gastrointestinal decompression, specific therapy and supportive care,** which consisted of 11 items.

**Scoring system of nurses' knowledge was the following**

- Correct and complete answer was scored (2).
- Correct and incomplete answer was scored (1).
- Incorrect answers was scored (0).

The total scoring systems of students' knowledge were (56) and classified as the following:

- Good if total knowledge score > 75%.
- Fair if total of knowledge score from 60% to 75%.
- Poor if total knowledge score < 60%.

**Tools (II) : Nurses' Observational Checklist about Emergent Nursing**

**Intervention of Acute Poisoning Patient:**

This tool was developed by the researcher after reviewing of related literature <sup>(15-23)</sup> except AVPU scale which developed by American College of Surgeons 1977 <sup>(24)</sup> to assess the actual emergent nursing intervention of acutely poisoning patient. It consisted of four domains:

1. **Emergent intervention:** Such as airway which includes airway patency, gag reflex, assist intubation, pharyngeal air way and suctioning. Breathing such as rate, rhythm, breathing sounds and oxygen therapy. Circulation which consisted of pulse rate and rhythm, blood pressure, bleeding, fluid therapy. Assessment of Alert, Verbal, Painful, Unresponsive scale (AVPU) and pupil reaction. It included 4 main items of resuscitation (2 sub items), air way management, (2 sub items), breathing management, (2 sub items) for circulation management and (2 sub items) for disability management.
2. **Patient assessment:** It included 2 items of assessment (4 sub items) for history taking, and (8 sub items) for physical examination.
3. **Antidote and drug administration:** It included 3 main parts of antidote (22 sub items) for intravenous medications, (15 sub items) for oxygen therapy, (5 sub items) for activated charcoal.

**4. Gastrointestinal decompression:**

which included 3 main parts of decontamination (4 sub items) for eye decontamination, (5 sub items) for skin decontamination, (3 sub items) for gastric decontamination which further include (4 items) for emesis, 11 items for gastric lavage and 4 items for whole bowel irrigation).

**Scoring system of nurses' practice was the following:**

- Correct and complete done was be scored (2).
- Correct and incomplete done was be scored (1).
- Incorrect done was scored (0).

The total scoring system of nurses' practice was calculated and classified as the following:

- The total score of practice  $\geq 70\%$  indicates satisfactory.
- The total score of practice  $< 70$  indicates unsatisfactory.

**Method**

1. Official Permission to carry out the study was obtained from the responsible authorities.

**2. Ethical consideration:**

- Informed consent was gotten from every nurse included in this study after explanation of the aim of the study and

assuring them of confidentiality of collected data.

- Confidentiality and anonymity were maintained and the right of withdrawal is reserved.

- Privacy of the studied nurses was maintained.

- Approval of ethical committee

3. All tools were developed by the researcher after review of the relevant literature <sup>(15-23)</sup> except AVPU scale in tool II which developed by American College of Surgeons 1977 <sup>(24)</sup> to monitor level of consciousness for poisoning patient.

4. The developed tools were translated into Arabic and tested for content validity by reviewer experts of Critical Care Nursing, Medical-Surgical nursing, Toxicology and Medical Biostatistics to judge clarity, comprehensiveness, relevance, simplicity, and accuracy. All of the remarks were taken into consideration; some items were re-phrased to reach the final version of the tools. The tools were regarded as valid from the experts' point of view.

5. The suitable statistical test was used for testing questionnaire reliability

6. A pilot study was carried out on (4) (10%) of nurses to test the tool for its clarity, applicability, and feasibility.

7. The suitable statistical test was used for testing questionnaire reliability.
8. Data were collected over a period of 7 months, started from February to August 2020.

### **Field of work**

The study was conducted at four phases which include: assessment, planning, implementation and evaluation.

### **Assessment phase of nurses' performance: -**

Nurses of both groups were assessed throughout the period of the study.

- Structured nurses' knowledge interview questionnaire distributed for all nurses before beginning the program.
- Assessment of the nurses' socio-demographic data using the tool I (part1) was collected from the nurses.
- Assessment of nurses' knowledge carried out using Tool I (part 2); the researcher assesses nurses knowledge pre-implementation of educational program
- Assessment nurses' practice carried out using Tool (II); the researcher assesses nurses practice pre- implementation of educational program.

### **Planning phase:**

This phase was formulated based on data from the assessment phase, literature review, priorities, goals and expected outcome criteria which taken into consideration when planning patients care.

### **Expected outcomes:**

- Improvement of nurses' knowledge about emergent nursing interventions regarding acute poisoning.
- Improvement of nurses practice post- implementing emergent nursing interventions about acute poisoning.

### **Teaching learning strategies:**

Selection of teaching learning strategies methods were governed by studying the subject and content of program

**Teaching methods** were lecture which was delivered in Arabic language and group discussion between the researcher and the nurses and demonstration were used as teaching method.

Teaching aids used for attainment of program objectives were: lab top, videos and power-point prepared by the researcher based on literature review. A colored booklet was developed to be given to the nurses.

### **Implementation phase:**

- Educational program about emergent nursing intervention was developed and implemented by the researcher to all nurses in the nursing room in the poisoning control center.

### **Educational session or program content:**

Educational sessions were given to all nurses included in the study and it was implemented over four sessions. Nurses were divided into small groups each one ranges from 2-5. Sessions for nurses were

carried out during the morning and afternoon shift.

The content of sessions divided into two theoretical and two practical sessions as follows:

**Theoretical part: It includes: *Session 1:***

Basic knowledge of acute poisoning. It included (definition, classifications, causes, clinical manifestations and complications of medicine and drugs).

***Session 2:*** which includes basic knowledge of acute poisoning management as (Resuscitation and initial stabilization, Diagnosis of type of poison, Nonspecific therapy, Specific therapy & Supportive care).

**Practical part: It includes: *Session 3:***

application of resuscitation, stabilization and assessment. ***Session 4:*** decontamination, administration of antidotes and supportive care.

**Evaluation phase:**

- Evaluation was done for both theoretical and practical part two times immediately and one month post implementation of educational program under supervision of researcher by using tool (I and II).
- Comparison was done to determine the effect of implementing emergent nursing intervention training program on nurse's performance (knowledge and practice) regarding acute poisoning.

- Comparison was done between Tanta University Poisoning Control Center and Elmanshawy General Hospital pre, immediate and one-month post-implementing training program.

**Statistical analysis:**

Data were fed to the computer and analyzed by using SPSS software statistical computer package version 26. For quantitative data, the mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test ( $\chi^2$ ). For comparison between means of two variables in a group, paired samples t-test was used. For comparison between means for variables during three periods of intervention in a group, or for more than two variables, the F-value of analysis of variance (ANOVA) was calculated. Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient R<sup>(25)</sup>.

**Result**

**Table (1):** Illustrates percentage distribution of the studied nurses according to their Sociodemographic characteristics. The result revealed that more than half of the studied nurses 55.6% and about three quarter 70.0% were in age groups between 21-30 years old in T.U.P.C.C and E.G.H.E.D groups. respectively .In **relation to sex**, it was clear that the



majority 85.2% and all 100% were females in T.U.P.C.C and E.G.H.E.D groups **respectively** . This table also, the majority of the studied nurses in T.U.P.C.C and all nurses in E.G.H.E.D groups were married 92.6% and 100% respectively. **Regarding educational level**, near half 48.1% in T.U.P.C.C group and more than half 60% of the studied nurses in E.G.H.E.D group are nursing technician. **As regard years of experience in emergency department**, it was noticed that near half 48.1% of nurses in T.U.P.C.C group had experience more than 10 years. Conversely; more than half 60.0% of nurses E.G.H.E.D group did not have any experience. **In addition**, it was observed that more than half (59.3%) and the majority (80.0%) of nurses did not attend training courses respectively for T.U.P.C.C and E.G.H.E.D groups respectively.

**Fig (1): This figure** shows that none of the studied nurses in T.U.P.C.C and E.G.H.E.D groups had a good level of knowledge before the implementation of educational program compared to the majority (96.3% and 100%) and (88.9% and 100%) who had a good knowledge level immediately and one-month post program implementation for T.U.P.C.C and E.G.H.E.D groups respectively.

**Fig (2): This figure** show distribution of the nurses' total knowledge mean score pre, immediately and one-month post program implementation of both studied groups. This figure highlighted that the nurses' total knowledge mean score pre-program implementation was ( $31.74 \pm 4.494$  and  $31.70 \pm 6.093$ ) which has been improved immediately into ( $51.07 \pm 4.187$  and  $50.10 \pm 2.807$ ) while mean score one-month post program implementation was ( $47.19 \pm 3.752$  and  $45.70 \pm 2.058$ ) in T.U.P.C.C group and in E.G.H.E.D group respectively. **In addition**, this figure concluded that there were A positive non statistically significant difference between two groups (T.U.P.C.C and E.G.H.E.D) where P value= (0.982, 0.502, 0.137) respectively in pre, immediate and one-month post program implementation.

**Figure (3):** This figure demonstrates percentage distribution of the **of the studied nurses' according to their** total practice level of both studied groups pre, immediately and one-month post program implementation. It was noticed that the minority (25.9% and 20%) of T.U.P.C.C and E.G.H.E.D respectively, nurses had a satisfactory practice level pre-program implementation, which enhanced to all of them 100% of both studied groups immediately and one-month post program implementation.

**Figure (4):** This figure clarified that there was a positive statistically significant correlation between the two groups (T.U.P.C.C and E.G.H.E.D) pre-program implementation where  $p = (0.002^*)$ . While, there was no significance correlation between the two groups immediately and one-month post program implementation where  $P = (0.620, 0.298)$  respectively.

**Table (2):** Presents correlation between total level of knowledge score of the studied nurses and their total practice scores in both groups pre, immediately and one-month post program implementation. This table shows that more than half of studied nurse (55.6%) and half (50%) of them had an unsatisfactory level of practice with a poor level of knowledge in T.U.P.C.C and E.G.H.E.D groups respectively pre-program implementation while the majority of the studied nurses (96.3%) and all nurses(100%) who had a satisfactory level of practice have a good level of knowledge immediately after program implementation compared to majority (88.9%) and all(100%)of studied nurses who had a satisfactory level of practice with a good level of knowledge one-month post program implementation. **Additionally**, it was found that there was a positive nonsignificant correlation between the total knowledge scores of the studied nurses and their total practice scores of

nursing intervention for patient with acute poisoning in pre-program implementation where ( $r = 0.208, P = 0.299$ ) and ( $r = 0.464, P = 0.177$ ), while immediately post - program implementation were a negative non-significant correlation where ( $r = -0.328, P = 0.095$ ) and ( $r = -0.206, P = 0.568$ ) in T.U.P.C.C and E.G.H.E.D groups respectively. In addition, there was a negative non-significant correlation where ( $r = -0.110, P = 0.585$ ) in T.U.P.C.C and positive significance correlation where ( $r = 0.739, P = 0.015$ ) between level of practice and total knowledge one-month post program implementation in group E.G.H.E.D.

**Table (3)** Show correlation between socio demographic characteristics of the studied nurses and their total knowledge score in both groups pre, immediately and one-month post program implementation. Regarding T.U.P.C.C there was a negative non-significant correlation between age and total knowledge scores ( $r = -0.062, P = 0.760$ ), ( $r = -0.067, P = 0.741$ ) and ( $r = -0.071, P = 0.726$ ) pre, immediate and one-month post program in T.U.P.C.C groups. Compared to positive significance correlation ( $r = 0.635, P = 0.049$ ) between age and total knowledge scores in E.G.H.E.D immediately post program implementation. **In addition**, there was a positive significant correlation where  $r =$

0.640 and  $P= 0.046$  between total knowledge score and educational level pre-program implementation in E.G.H.E.D group. While, there was a positive non-significant correlation between Experience (in years) in emergency department and total knowledge score pre, immediate and one-month post program implementation in both groups respectively. **Finally**, there was a positive non significant correlation between attendance of training programs and total knowledge score in both groups except pre and immediate program implementation in T.U.P.C.C were negative  $r= (-0.049$  and  $-0.076)$ .

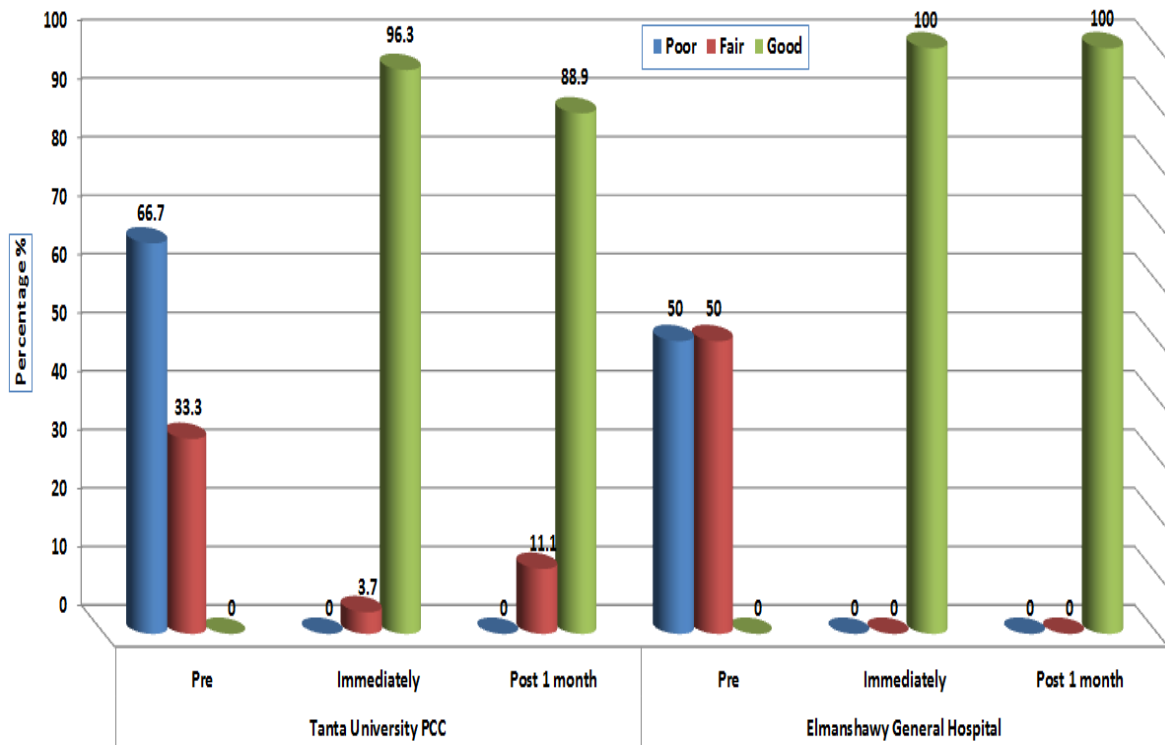
**Table (4)** Illustrate correlation between socio demographic characteristics of the studied nurses and their total practice score in both groups pre, immediately and one-month post program implementation. There was A positive non-significant correlation between total practice level scores and age in years among nurses in T.U.P.C.C and E.G.H.E.D groups except on immediately and post one month of program implementation where it was a negative significant ( $r= -0.413$ ,  $P=0.032$  and  $r=-0.606$ ,  $P= 0.001$ ) among nurses in T.U.P.C.C. In relation to educational level, it was noticed that there was a positive non- significant correlation with total practice level scores pre, immediately and

one-month post program implementation in both studied groups.

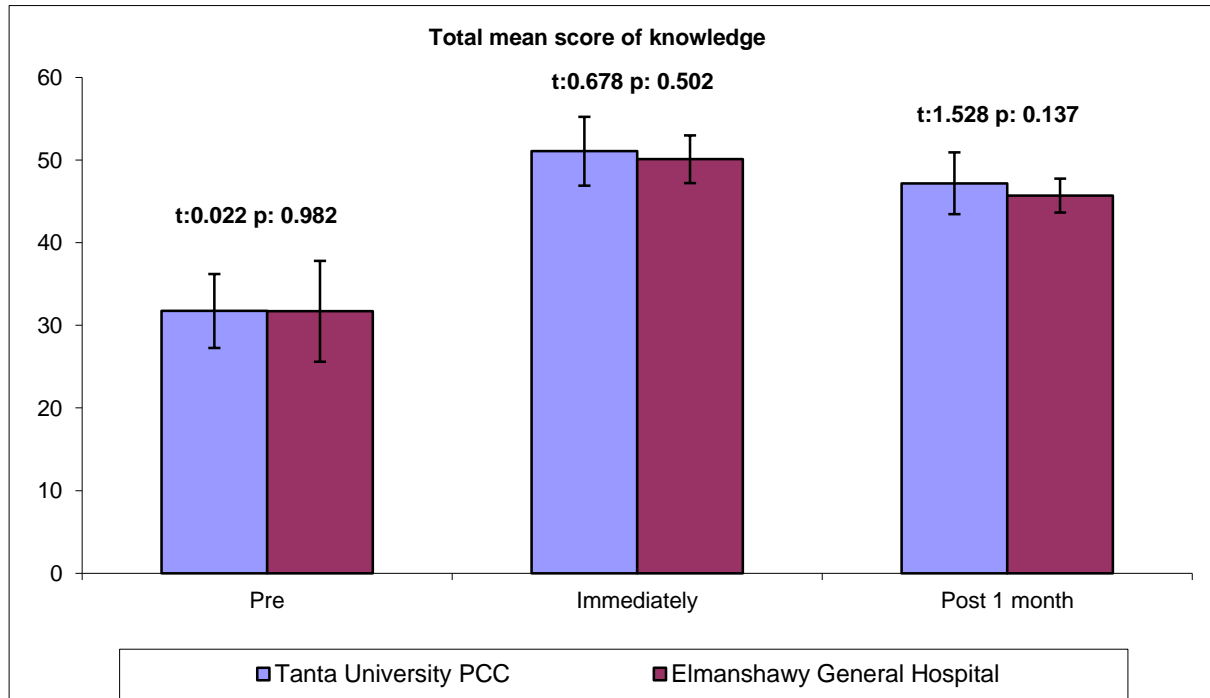
**Table (1): Percentage distribution of the studied nurses according to their Sociodemographic characteristics.**

| Characteristics   | The studied nurses (n=37)           |      |  |       | $\chi^2$<br>P      |
|---|-------------------------------------|------|--|-------|--------------------|
|   | Tanta university<br>P.C.C<br>(n=27) |      | Elmanshawy General<br>Hospital E.D<br>(n=10) |       |                    |
|   | N                                   | %    | N  | %     |                    |
| <b>Age (in years)</b>   |                                     |      |  |       |                    |
| ▪ (21-30)   | 15                                  | 55.6 | 7  | 70.0  | 4.688<br>0.196     |
| ▪ (31-40)   | 8                                   | 29.6 | 2  | 20.0  |                    |
| ▪ (41-50)   | 0                                   | 0.0  | 1  | 10.0  |                    |
| ▪ (51-60)   | 4                                   | 14.8 | 0  | 0.0   |                    |
| <b>Range</b>  | <b>(22-55)</b>                      |      | <b>(21-46)</b>                               |       | t=1.251<br>P=0.219 |
| <b>Mean ± SD</b>  | <b>33.19±9.274</b>                  |      | <b>29.10±7.355</b>                           |       |                    |
| <b>Gender</b>   |                                     |      |  |       |                    |
| ▪ Male  | 4                                   | 14.8 | 0  | 0.0   | FE<br>0.557        |
| ▪ Female  | 23                                  | 85.2 | 10   | 100.0 |                    |
| <b>Marital status</b>   |                                     |      |  |       |                    |
| ▪ Married   | 25                                  | 92.6 | 10   | 100.0 | FE<br>1.00         |
| ▪ Single  | 2                                   | 7.4  | 0  | 0.0   |                    |
| <b>Educational level</b>  |                                     |      |  |       |                    |
| ▪ Diploma   | 11                                  | 40.7 | 1  | 10.0  | 5.453<br>0.142     |
| ▪ Technician  | 13                                  | 48.1 | 6  | 60.0  |                    |
| ▪ Bachelor  | 3                                   | 11.1 | 2  | 20.0  |                    |
| ▪ Post studies  | 0                                   | 0.0  | 1  | 10.0  |                    |
| <b>Experience (in years) in emergency department</b>  |                                     |      |  |       |                    |
| ▪ None  | 0                                   | 0.0  | 6  | 60.0  | 4.451<br>0.325     |
| ▪ < 5   | 2                                   | 7.4  | 1  | 10.0  |                    |
| ▪ (5-10)  | 12                                  | 44.4 | 3  | 30.0  |                    |
| ▪ > 10  | 13                                  | 48.1 | 0  | 0.0   |                    |
| <b>Range</b>  | <b>(2-15)</b>                       |      | <b>(0-10)</b>                                |       | t=2.658<br>P=0.204 |
| <b>Mean ± SD</b>  | <b>9.00±3.101</b>                   |      | <b>2.30±3.466</b>                            |       |                    |
| <b>Attendance of training programs about management for acute poisoning patients (in weeks)</b> |                                     |      |  |       |                    |
| ▪ None  | 16                                  | 59.3 | 8  | 80.0  | 3.198<br>0.362     |
| ▪ < 1   | 4                                   | 14.8 | 2  | 20.0  |                    |
| ▪ (1-2)   | 5                                   | 18.5 | 0  | 0.0   |                    |
| ▪ > 2   | 2                                   | 7.4  | 0  | 0.0   |                    |
| ▪ > 2   |                                     |      |  |       |                    |

FE: Fisher' Exact test



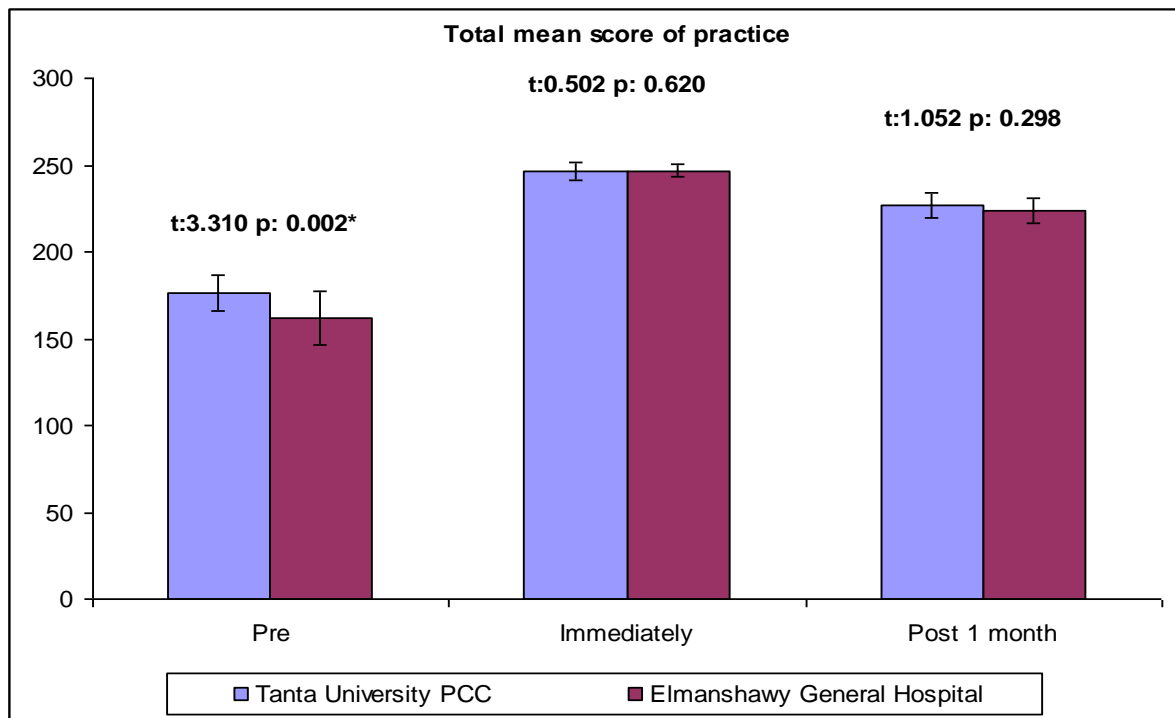
**Fig (1): percentage distribution of the nurses' total knowledge scores pre, immediately and one-month post program implementation of both studied groups**



**Fig (2): Distribution of the nurses' total knowledge mean score pre, immediately and one-month post program implementation of both studied groups.**



**Figure (3):** Percentage distribution of the studied nurses' according to their total practice level of both studied groups pre, immediately and one-month post program



implementation

**Figure (4):** Distribution of the studied nurses' mean scores of total practice of both studied groups pre, immediately and one-month post program implementation

**Table (2): Correlation between total level of knowledge score of the studied nurses and their total practice scores in both groups pre, immediately and one-month post program implementation**

| Total knowledge level | The studied nurses (n=37) |      |              |      |                |               |                                     |    |       |             |               |
|-----------------------|---------------------------|------|--------------|------|----------------|---------------|-------------------------------------|----|-------|-------------|---------------|
|                       | T.U.P.C.C (n=27)          |      |              |      |                | $\chi^2$<br>P | Elmanshawey General Hospital (n=10) |    |       |             | $\chi^2$<br>P |
|                       | Unsatisfactory            |      | Satisfactory |      | Unsatisfactory |               | Satisfactory                        |    |       |             |               |
|                       | N                         | %    | N            | %    | N              |               | %                                   | N  | %     |             |               |
| <b>Pre</b>            |                           |      |              |      |                |               |                                     |    |       |             |               |
| ▪ Poor                | 15                        | 55.6 | 3            | 11.1 | FE<br>0.175    | 5             | 50.0                                | 0  | 0.0   | FE<br>0.222 |               |
| ▪ Fair                | 5                         | 18.5 | 4            | 14.8 |                | 3             | 30.0                                | 2  | 20.0  |             |               |
| <b>r , P</b>          | 0.208 , 0.299             |      |              |      |                |               | 0.464 , 0.177                       |    |       |             |               |
| <b>Immediatel</b>     |                           |      |              |      |                |               |                                     |    |       |             |               |
| ▪ Fair                | 0                         | 0.0  | 1            | 3.7  | -              | 0             | 0.0                                 | 0  | 0.0   | -           |               |
| ▪ Good                | 0                         | 0.0  | 26           | 96.3 |                | 0             | 0.0                                 | 10 | 100.0 |             |               |
| <b>r , P</b>          | -0.328 , 0.095            |      |              |      |                |               | -0.206 , 0.568                      |    |       |             |               |
| <b>Post 1 month</b>   |                           |      |              |      |                |               |                                     |    |       |             |               |
| ▪ Fair                | 0                         | 0.0  | 3            | 11.1 | -              | 0             | 0.0                                 | 0  | 0.0   | -           |               |
| ▪ Good                | 0                         | 0.0  | 24           | 88.9 |                | 0             | 0.0                                 | 10 | 100.0 |             |               |
| <b>r , P</b>          | -0.110 , 0.585            |      |              |      |                |               | <b>0.739 , 0.015*</b>               |    |       |             |               |

r: Pearson correlation coefficient      Significance at level  $P < 0.05$ . \*\* Highly significance at level  $P < 0.01$ .

**Table (3): Correlation between socio demographic characteristics of the studied nurses and their total knowledge score in both groups pre, immediately and one-month post program implementation.**

| Characteristics                               | Total knowledge score |       |             |       |              |       |                                     |        |             |        |              |       |
|---|-----------------------|-------|-------------|-------|--------------|-------|-------------------------------------|--------|-------------|--------|--------------|-------|
|   | Mean $\pm$ SD         |       |             |       |              |       |                                     |        |             |        |              |       |
|   | T.U.P.C.C (n=27)      |       |             |       |              |       | Elmanshawey General Hospital (n=10) |        |             |        |              |       |
|   | Pre                   |       | Immediately |       | Post 1 month |       | Pre                                 |        | Immediately |        | Post 1 month |       |
| r   | P                     | r     | P           | r     | P            | r     | P                                   | r      | P           | r      | P            |       |
| Age (in years)                                | -0.062                | 0.760 | -0.067      | 0.741 | -0.071       | 0.726 | 0.556                               | 0.095  | 0.635       | 0.049* | 0.531        | 0.14  |
| Educational level                             | 0.357                 | 0.067 | -0.157      | 0.435 | 0.023        | 0.910 | 0.640                               | 0.046* | -0.207      | 0.567  | -0.007       | 0.986 |
| Experience (in years) in emergency department | 0.044                 | 0.827 | 0.234       | 0.240 | 0.053        | 0.793 | 0.231                               | 0.521  | 0.613       | 0.059  | 0.606        | 0.063 |
| Attendance of training programs               | -0.049                | 0.810 | -0.076      | 0.706 | 0.133        | 0.507 | 0.588                               | 0.074  | 0.169       | 0.641  | 0.333        | 0.347 |

r: Pearson correlation coefficient      Significance at level  $P < 0.05$ . \*\* Highly significance at level  $P < 0.01$ .

**Table (4): Correlation between socio demographic characteristics of the studied nurses and their total practice score in both groups pre, immediately and one-month post program implementation**

| Characteristics                               | Total practice score |       |             |        |              |        |  |       |             |       |              |       |
|---|----------------------|-------|-------------|--------|--------------|--------|--|-------|-------------|-------|--------------|-------|
|   | Mean ± SD            |       |             |        |              |        |  |       |             |       |              |       |
|   | T.U.P.C.C<br>(n=27)  |       |             |        |              |        | Elmanshawey General Hospital<br>(n=10) |       |             |       |              |       |
|   | Pre                  |       | Immediately |        | Post 1 month |        | Pre                                    |       | Immediately |       | Post 1 month |       |
|   | r                    | P     | r           | P      | r            | P      | r                                      | P     | r           | P     | r            | P     |
| Age (in years)                                | 0.018                | 0.930 | -0.413      | 0.032* | -0.606       | 0.001* | 0.555                                  | 0.096 | 0.141       | 0.697 | 0.397        | 0.256 |
| Educational level                             | 0.031                | 0.877 | 0.277       | 0.162  | 0.261        | 0.189  | 0.362                                  | 0.303 | 0.569       | 0.086 | 0.203        | 0.574 |
| Experience (in years) in emergency department | -0.024               | 0.906 | -0.210      | 0.293  | -0.372       | 0.056  | 0.284                                  | 0.426 | -0.253      | 0.482 | 0.251        | 0.484 |
| Attendance of training programs               | -0.178               | 0.375 | 0.110       | 0.586  | 0.125        | 0.534  | 0.574                                  | 0.083 | 0.441       | 0.202 | 0.363        | 0.302 |

r: Pearson correlation coefficient  
level P<0.01.

Significance at level P<0.05. \*\* Highly significance at



## Discussion

Acute poisoning is a major health problem leading to emergency and intensive care unit (ICU) admission<sup>(26,27)</sup>. Early diagnosis and immediate effective management improve patient outcomes, saving lives and decreasing mortality<sup>(28)</sup>. Nurses are generally the first responder in the emergency department for acute poisoning patients and they require a program on a regular basis in order to improve their nurses' knowledge and practice provided to patients with poisoning<sup>(29)</sup>. So, this study was aimed to determine the effect of emergent nursing educational program on nurses' performance for patients with acute poisoning. Implementation of the educational program led to significant improvements in nurses' knowledge and practice immediately and one-month post program implementation in both studied groups. This improvement might be related to the majority of nurses who are enthusiastic to learn and have highly expressed need to learn more about acute poisoning management.

**Concerning the acquisition of knowledge**, the result of the current study revealed that the nurses hadn't a good level of knowledge about acute poisoning before program implementation in both study groups. This might be related to the fact that most nurses had nursing technician in

nursing education in which the content was limited in their curriculum, lack of availability of manual booklets, nurses abandon reading, work overload and most of nurses did not attend training programs about management for acute poisoning patients.

These results were congruent with **Sayed et al, (2015)**<sup>(11)</sup>, who revealed that all studied nurses in Cairo University had unsatisfactory level of knowledge. Also, a study conducted by **Abebe, (2019)**<sup>(30)</sup> in Ethiopia Dessie referral hospital and concluded that the studied nurses had unsatisfactory knowledge level. Consequently, **Kingsley et al, (2017)**<sup>(31)</sup> revealed that there was a poor knowledge level among health care professionals regarding poison management in Douala. Moreover, **Lekei et al, (2017)**<sup>(32)</sup> revealed that health care provider had inadequate knowledge level about what to do about Acute Pesticide Poisoning in South Africa. However, **Hakami et al, (2018)**<sup>(33)</sup> concluded that most of the studied sample in Riyadh City had adequate knowledge level, from the researcher point of view, that about two-thirds of the studied student receive first aid and emergency training. As well, **Goktas et al, (2014)**<sup>(34)</sup> carried out the study to assess knowledge regarding first aid in poisoning cases and reported that the majority of studied

sample had good knowledge level in Istanbul, from the researcher point of view, that the highest proportion of the studied student in the medical department.

Also, this finding shows that the educational program had a good impact on improving nurses' knowledge, which could be due to the concise presentation of each session using simple Arabic language, clear educational methods, instructional media and the availability of researcher in the field for more clarification, and frequent repetition to fix the knowledge.

This result was supported by **Gharib et al, (2017)** <sup>(35)</sup> who carried out a study for toxicology nurses in the national center for clinical and environmental toxicology Research illustrated that the sessions were successful in improving nurse's knowledge in Cairo university hospitals. In addition, **El-Bahnasawy et al, (2015)** <sup>(36)</sup> proved this study when conducting a Program for Nurses about health hazards of chemical insecticides exposure in a practical field at Ain Shams university and emphasized that there was a significant improvement in total knowledge scores of nurses in post-test and follow up when compared to pre-test. Additionally, **RAJ A (2013)** <sup>(37)</sup> showed improvement in mean score of the studied sample regarding house hold poisoning when conducting a structured teaching program regarding house hold

poisoning in children among mothers in in Bangalore, Karnataka. Moreover, **Zaveri et al, (2019)** <sup>(38)</sup> supported the present study result and found that there was improvement in knowledge post program implementation.

**Regarding the acquisition of skill performance**, the current study shows that most of studied nurses had unsatisfactory practice in both studied group before the application of nursing educational program. This may be attributed to the poor knowledge level, shortage of nursing staff, increasing work overload, lack of nurses' evaluation against the standards nursing practice by nursing supervisor and head nurses for detecting the strength and weakness point to work on it and refusal of some nurses to change their practice.

In agreement with current study finding was **Rutto et al, (2012)** <sup>(39)</sup> who noticed that the nurses in acute and emergency department nurses in Kenia had unsatisfactory practical level about initial management of acute poisoning. As well, **Hanafi et al, (2012)** <sup>(40)</sup> and **Hussien et al, (2014)** <sup>(41)</sup> in Tehran revealed that poor practices among studied nurses regarding care for poisoning at emergency unit. Additionally, **Blanchard, (2019)** <sup>(42)</sup> and **Rajalakshmi et al, (2017)** <sup>(43)</sup> revealed that the studied sample didn't rely on proper treatment measures for poisoning patient in

India and Tiruchanoor, Tirupati respectively.

On the other hand, the result of the present study revealed that all studied nurses had satisfactory practice level immediately and one-month post program implementation than pre- program implementation with significant improvement in both studied groups. This improvement may be attributed to a combination of the theoretical part and the practical training element of the intervention which was effective in improving the nurses' practice, providing the nurse with colored booklet, using of audiovisual aids, proper communication and demonstration.

This result is supported by **Bakr Moshtohry (2018)**<sup>(44)</sup> who reported that application of the guiding program has a positive effect to improve the practice of the studied sample regarding first aid for poisoning in rural areas in Ain Shams. As well, **Fathy et al, (2020)**<sup>(45)</sup> stated that there was a significant improvement in the studied sample practice to prevent pesticide hazards in Suez Canal University. Additionally, **Sibani, (2017)**<sup>(46)</sup> reported improvement of health care provider for treatment of pesticide poisoning in Uganda.

**Regarding safety preparations of the nurses,** educational sessions induced

significant improvement in nurses' skills immediately and one-month post- program in both studied groups compared to pre-program regarding (hand washing, using personal protective equipment) in T.U.P.C.C group.

This result was supported by **Maheswari et al, (2014)**<sup>(47)</sup> who heightened that the studied employed sample lack to uses universal precautions which developed to good level regarding Universal Precautions post Program implementation in Puducherry, India. Also, **Arafat et al, (2018)**<sup>(48)</sup> concluded that there was a statistically significant improvement post program implementation regarding infection control guidelines compared to before implementation in Port Said university, Egypt. In addition, **Fathy et al, (2020)**<sup>(45)</sup> indicated that the use of personal protective equipment regarding pesticide poisoning improved immediately post-test and declined slightly in the follow-up period compared with pre-program implementation in Suez Canal University, Egypt.

**In relation to emergent intervention,** the current study results indicated that there was significant improvement in nurses mean practice score of both studied groups immediately and one-month post program implementation except emergent

intervention in T.U.P.C.C as it considered a routine procedure in the center.

**Little, (2009)** <sup>(49)</sup> result was matched with the current results as they mentioned that there was dramatically improved in care provided to poisoned patient in emergency observation unit after service application in Perth, Australia. In addition, **Nhan, (2019)** <sup>(50)</sup> And **Saramma et al, (2016)** <sup>(51)</sup> the stated that the practice skills of the studied sample about Basic life support for the studied nurses had significantly increased after planned educational program in Kerala, India.

On the other hand, **Urushibata et al, (2017)** <sup>(52)</sup> was disagreed with the present results and mentioned that even after training, some participants were not able to adequately perform chest compressions under the guidelines for chest compression depth for health care provider in Japan. This can be justified by noncompliance with new guidelines.

**Regarding decontamination**, the findings of the present study clarified that the nurses' practice regarding eye decontamination had a significant improvement in both studied groups post program implementation when compared to pre- program implementation. **Fashafsheh et al, (2013)** <sup>(53)</sup> supported this study and reported that educational

intervention in North Palestine hospitals improved of studied sample practice about eye care and decrease complications.

As well, there was only significant improvement post program implementation regarding gastric lavage in E.G.H.E.D.this may be explained by the fact that nurses are newly distributed in poisoning center and decreased years of experience. And significant improvement related to bowel irrigation in both studied groups, because it is not considered as a routine practice. **Borja et al, (2018)** <sup>(54)</sup> and **El-Meanawi, (2017)** <sup>(55)</sup> was in the same line with the current study and reported that educational intervention improved the studied nurse's performance regarding implementation of drug and food via nasogastric tube in Alexandria University.

**Concerning correlation**, the present study demonstrated that, there were no statistical significance difference between nurse's socio demographic characteristics as (age, educational level, years of experience and attending training program) and nurse's knowledge among T.U.P.C.C group. **However**, there was a statistical significance difference regarding age immediately pre-program implementation in E.G.H.E.D.

In this regard, **Sreelakshmy, (2016)** <sup>(56)</sup> was in the same line with this finding, who

reported that there was no significant relation between nurses' knowledge and socio demographic characteristics such as age, educational qualification and clinical experience in Trivandrum, India. Also, **Sayed et al, (2015)** <sup>(11)</sup> showed no statistical significance between sociodemographic characteristics in (age, years of experience and qualifications) and total knowledge level in Cairo University. However, **Mohammed, (2017)** <sup>(57)</sup> showed that there was statistically significant difference between socio-demographic characteristics of the studied nurses and their knowledge in Ain Shams University. As well **Rutto et al, (2012)** <sup>(39)</sup> revealed that socio demographic of nurses such as level of education and age had impacted the initial management of acute poisoning in Kenia.

**In addition,** the present study demonstrated that there was non-significant correlation between sociodemographic characteristics and total mean of practice in E.G.H.E.D. **Abdallah, (2018)** <sup>(58)</sup> was in agreement with this finding and reported that no significant statistical difference between total mean practice scores in relation to socio demographic characteristics as (age and year of experience) at Shandi University. And **Sayed et al, (2015)** <sup>(11)</sup> showed no statistical significance between

sociodemographic characteristics in (age, years of experience and qualifications) and total practice level.

## Conclusion

**Based on the finding of the current study;** it can be concluded that after application of emergent intervention educational program to nurses for patients with acute poisoning, there was a significant improvement in the mean scores of the total level of knowledge and the mean scores of the total practice immediately and one-month post program implementation among two studied nurses' groups compared to the pre -program implementation.

There was a significant improvement in nurses' skills immediately and one-month post- program compared to pre-program implementation in both studied groups regarding safety preparations, antidote and drug administration.

There was a positive statistically significant correlation between the two groups (T.U.P.C.C and E.G.H.E.D) pre-program implementation regarding to total mean of practice. While, there was no significance differences between two groups immediately and one-month post program implementation.

Also, there was a positive non statistically significant difference between two groups (T.U.P.C.C and E.G.H.E.D) in pre, immediate and one-month post program implementation regarding to total mean of knowledge.

### Recommendations

Based on the findings of the present study, the following recommendations are suggested:

#### For nursing practice

- Periodic in-service training program and regular lectures should be provided to nursing staff in order updating their knowledge and practice

- Distribute guideline booklet for poisoning control center nurses about emergent intervention for acute poisoning management.

-A system for accreditation and certification should be developed to motivate nurses' participation in the training and educational programs which should be conducted in the work place.

#### For nursing education

-Developing a system of periodical nurse's evaluation to determine strategies for updating their knowledge and enhancing their practice regarding acute poisoning management.

-The management for acute poisoning patient can be included within the

curriculum of both diploma degree and technical institutions of health.

1. Replication of the program in other hospitals to improve the nurses' knowledge and practices regarding acute poisoning management.

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