CRITICAL CARE NURSES' KNOWLEDGE AND PRACTICES ABOUT TOXICOLOGICAL EMERGENCIES

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ABSTRACT

Background: A global public health problem is poisoning. Also consider one of the most important reasons for attendance in emergency unit. The critical care nurses play an essential role in assessing poisoning patient at emergency unit .Patients with poisoning have a better chance of surviving if they are identified early and treated effectively. **Aim:** This study aimed to assess knowledge and practices of critical care nurses about toxicological emergencies. **Subjects and method: Study Design:** A descriptive design was utilized in this research. **Setting:** This study was carried out at poisoning center in Al-Mansura city, emergency department in Al-Manzala central hospital and El-Salam hospital. **Subjects:** A convenient sample of 81 nurses included in the study. **Tools:** Two tools used for data collection, nurses' knowledge questionnaire and nurses' practice observational checklist. **Results:** More than half (54.3%) of participants had poor knowledge; however (76.5%) of them had acceptable practices about toxicological emergencies. There was a positive statistical significant correlation between overall nurses' knowledge and practices about toxicological emergencies as p value is 0.002. **Conclusion:** This study concluded that 54.3% of participants had overall poor knowledge and 76.5% of them had acceptable practices about toxicological emergencies. There was a positive statistical significant correlation between overall nurses' knowledge and practices about toxicological emergencies. **Recommendation:** Educational training programs for nurses regarding toxicological emergencies are recommended.

INTRODUCTION

Poisoning is define as a term used to describe an occurrence in which toxic substances reach the body through the mouth, blood vessels, food, or injections, causing the death and destruction of the body's cells (Shahkolai et al., 2019). Poisoning may occur either intentionally or unintentionally. Toxicology may be defined as the study of the action of poisons on the living organism (Satpathy & Parida, 2020).

Any agent that can harm, disable, or impair normal physiological function in humans, causing general or local damage or dysfunction in the body, is considered a poison (Getie & Belayneh, 2020). Poison is also described as a substance (solid, liquid, or gas) that, when ingested into or in contact with any part of a living body, causes illness or death through constitutional or local effects, or both (Patil, Tasgaonkar & Jatti, 2020).

Because of changes in human lifestyle and social behavior, the number of poisoning cases is on the rise. According to (Poison control and unintentional poisoning, 2019), more than three million people worldwide takes poison per year, resulting in 251,881 deaths. Developing countries account for almost all these deaths (Abebe, Kassaw & Shewangashaw, 2019).

Management should focus on prevention of poisoning, but when poisoning does occur, give priority to airway, breathing, and circulation. Regularly monitor vital signs and provide supportive care. There are few unique antidotes for drugs or other toxins. Inducing vomiting with ipecac is an uncommon occurrence in the medical field. Gastric lavage activated charcoal administration (binds with the chemical material in the intestine), or whole bowel irrigation with polyethylene glycol electrolyte solutions are all options. To reduce the amount of toxin in the bloodstream, dialysis can be needed on occasion. The intervention is dependent on the ingestion source. Activated charcoal, for example, is effective in preventing the absorption of certain drugs but not in the case of an iron overdose (Abdallah, 2018).

Nurses should be knowledgeable about emergency management, diagnosis, antidote administration, and supportive therapy to help treat patients. They should be knowledgeable about poisoning prevention. They should identify the needs of the

individual and their families and develop a care plan for them. They collaborate with other nurses and social workers to assist clients with basic living skills and social activities so that they lead a normal life as possible (Joda, Ajetunmobi, & Olugbake, 2021).

Significance of the study:

A main reason of morbidity and mortality globally is poisoning. Poisoning events are thought to cause more than one million illnesses per year around the world. After road traffic accidents, burns, and drowning, poisoning is the fourth leading cause of accidental injury (Usha, 2017). According to WHO statistics, in 2021 documented a mortality rate of 1.4 persons per 100000 populations globally and 2.7 persons per 100000 populations in Africa from unintentional poisoning (Joda, Ajetunmobi, & Olugbake, 2021)

Critical nurses play an important role in the treatment and management of poisoned patients, which includes four steps: initial life support, decontamination, antidote therapy, and enhanced elimination. Airway control and circulatory condition correction are the first steps of life support. Preventing aspiration and respiratory insufficiency due to reduced consciousness necessitates protecting the airway. If arrhythmias and hemodynamic compromises are not treated, patients in critical condition will die (Mohamed, 2020).

AIM OF THE STUDY:

This research aimed to assess knowledge and practices of critical care nurses about toxicological emergencies. This aim achieved through;

　　a) Assess critical care nurses' knowledge about toxicological emergencies.

　　b) Assess critical care nurses' practices about toxicological emergencies.

SUBJECTS AND METHOD:

Study Design:

A descriptive research design was utilized.

Study Setting:

This study carried out at a poisoning center, in Al-Mansura city, emergency department in Al-Manzala central hospital and emergency department in El-Salam hospital. The poisoning center in Al-Mansoura city contains two rooms for reception of cases every rooms contains two bed and two rooms for entering of cases every room contains four beds and this center considers the only place that receives cases in the

province of Dakahlia. The emergency department in Al-Manzala central hospital contains two rooms each room contains four beds and this hospital is considering the only place that receives cases in this city. The emergency department El-Salam hospital contains two rooms each room contains four beds and this hospital is considering the only place that receives cases in this city.

Study Subjects:

A Convenient sample of a total of 81 nurses, 6 nurses from poisoning center, 55 nurses from Al-Manzala Central Hospital, and 25 nurses from El-Salam Hospital.

Tools of data collection:

Two tools were used to collect data for this study.

Tool I: Nurses' Knowledge questionnaire

It was developed by **Mokhtar Abdu Hamid Almoliky (2013)** in Arabic language and used to assess knowledge of nurses about toxicological emergencies; it was divided into three sections, as follows:

Part 1: Demographic characteristic e.g. nurses age, sex, and qualifications.

Part 2: Work related data as unit of work, attending training programs, name of training courses and years of experience regarding toxicological emergencies.

Part 3: Nurses' Knowledge question that includes (46) closed ended questions covering the areas of definition, signs and symptoms of all type of poisoning, initial assessment for patient admitted with poisoning.

The scoring system for knowledge nurses' responses as the following: Correct response scored with two points, and incorrect response scored with one point. The cut-off point of good score is >75% of total score which means that the nurse has sufficient knowledge about toxicological emergencies. Fair score is falls between 50% and 75% of the total score and means that the nurse has acceptable knowledge about toxicological emergencies. Poor score is considered when the nurses had <50% of total score, which means that the nurse has insufficient knowledge about toxicological emergencies.

Tool (II): Nurses' practice observational checklists:

It developed by **Mokhtar Abdu Hamid Almoliky (2013)** and translated by the researcher to assess care provided by critical care nurses for poisoned patients; it will include two parts:

Part 1: Nurses' practices regarding initial assessment and resuscitation. This part includes items about performing initial assessment (5) items and initial management that include oropharyngeal airway insertion (13) items, basic life support (BLS) (18) items, assist with endotracheal tube insertion (16) items, assist with defibrillation (20) items, Suctioning (27) items.

Part 2: Nurses' practice regarding immediate management for poisoned patients. This part includes items about Gastric decontamination that involved (Nasogastric tube insertion (22) items, gastric lavage (23) items and administrating an activated charcoal (18) items), perform the dermal and ocular decontamination measures (11) items and antidote administration (7) items.

The scoring system of practice: The nursing intervention will be measured using done or not done. The data will be scored by (2= done, 1= not done and 0= not applicable). The cut-off point of competent nurse is >75% of total score. This means that the critical care nurse has sufficient practices to care for patient with toxicological emergencies. The critical care nurse has an acceptable practice to care for patient with toxicological emergencies if total score is falls between 50% and 75%. Insufficient nurse is <50% of total score which means that the critical care nurse is incompetent in practices to care for patient with toxicological emergencies.

Tool Validity:

It was ascertained by a jury consisting of eleven experts in the field of medical surgical nursing from faculty of nursing and faculty of medicine. The part of nurses' practice regarding toxicological emergencies was in English and translated by the researcher. The experts revised the tools to make sure that the study tools looks through it measured what supposed to measure and necessary modifications are done according to the experts' opinions.

Reliability:

Cronbach alpha coefficient was calculated to assess the reliability of the study tools through their internal consistency. Cronbach alpha value for overall knowledge was (0.905), and for overall practice was (0.861).

Pilot Study:

A pilot study is carried out on 9 nurses (10%) of total number of nurses to ensure the tools clarity, feasibility, and applicability before starting data collection and to estimate the time needed to complete the tools. The necessary modification was done, and the final form is developed. The nurses participated in pilot study were not participated in the final subjects of the study.

Field Work:

The data was collected from available nurses who have been working in the previous mentioned setting and who have been providing direct care to poisoned patients. The process of data collection took a period of six months from the first of March (2020) to the last of August (2020). The researcher was met the nurses individually and discuss the aim of the research and obtains vocal consent. Then distribute the questions to them, questioner takes about 20 minutes to fill from each nurse. Two days a week, during the morning and afternoon shifts, the researcher was available. Each nurse was observed by the researcher during care provision to the poisoned patient. Nurses were evaluated by the researcher using the observational checklists, during (morning and afternoon shifts) the time needed to complete the checklist ranged from 15 to 20 minutes.

Administrative design:

A written permission from the dean of the Faculty of Nursing at Port Said University was obtained for the study's conduct and official letter were sent to the selected area of the study. The director of the hospitals was conducted and informed consent was obtained from the nurses included in the present study.

Ethical consideration:

Throughout the study, all ethical considerations were put into consideration. Nurses gave their written consent to participate in this research. The research's aim and its procedures were discussed to each participant before starting data collection. The nurses

had right to accept, refuse or withdrawal at any time from the research. The participants' confidentiality and autonomy were maintained by the researcher.

Statistical analysis:

The collected data was loaded into a computer and processed with IBM SPSS software package version 20.0. (IBM Corporation, Armonk, NY) Number and percent were used to describe qualitative data. Range (minimum and maximum), mean, and standard deviation were used to describe quantitative data. The significance of the acquired results was considered when p- value ≤ 0.05.

RESULTS:

Table (1): indicates that 53.1% of the studied nurses were at age group from 20 to less than 30 years. In terms of gender and education, 64.2% were female, and 64.2 % had graduated from a technical institute of nursing.

Table (2): shows that 92.6% of the studied nurses worked in an emergency unit, 86.4% of them join in training programs, and 97.1% of them get CPR training. In addition, 49.4% of them their working experience ranging from 5 to less than 10 years, with an average of 5.91 ± 3.64 years.

Figure (1): Finds that, more than half (54.3%) of studied nurses had poor overall knowledge regarding toxicological emergencies, 40.7% of them had fair overall knowledge concerning the toxicological emergencies and only 4.9% of them had good overall knowledge regarding toxicological emergencies.

Figure (2): Indicates that, 76.5% of studied nurses had acceptable overall practices regarding toxicological emergencies, 19.8% of them had sufficient overall practices regarding toxicological emergencies and only 3.7% of them had insufficient overall practices regarding toxicological emergencies.

Table (3): Demonstrates that, there was a positive statistically significant correlation between studied nurses' overall knowledge and overall practice regarding toxicological emergencies.

Table 1: Demographic data of the studied nurses (n=81)

Demographic data	No.	%
	81	100
Age		
20 - <30	43	53.1
30- <40	35	43.2
40 – 50	3	3.7
Min. – Max.	21.0 – 42.0	
Sex		
Male	29	35.8
Female	52	64.2
Qualification		
Bachelor of nursing	8	9.9
Technical institute of nursing	52	64.2
Technical secondary school of nursing (Diploma)	21	25.9

Table 2: Work-related data of the studied nurses (n=81)

Work-related data	No.	%
	81	**100**
Unit		
Emergency	75	92.6
Poisoning center	6	7.4
Training programs/ courses		
Yes	70	86.4
No	11	13.6
Names of training courses (n = 70)		
CPR	68	97.1
Poisoning	6	8.6
Triage	25	35.7
Other (Reception)	16	22.9
Year of experience		
<5	33	40.7
5- <10	40	49.4
≥10	8	9.9

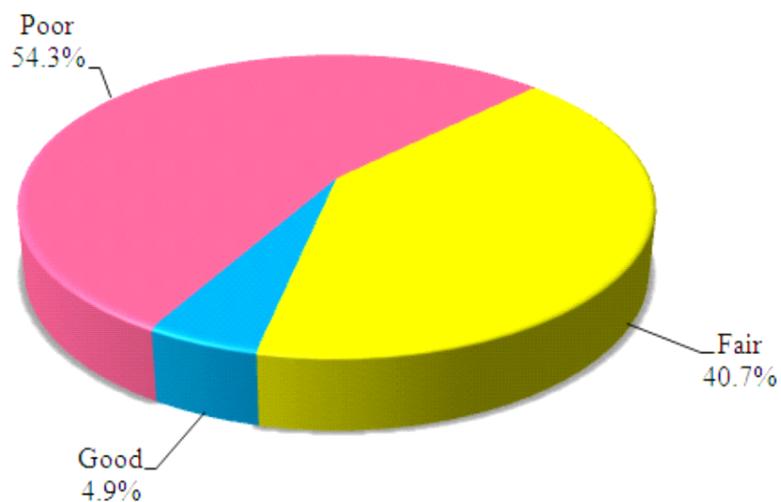| Min. – Max. | 1.0 – 18.0 |
| Mean ± SD. | 5.91 ± 3.64 |

Figure (1): Nurses' overall knowledge regarding toxicological emergencies (n = 81)
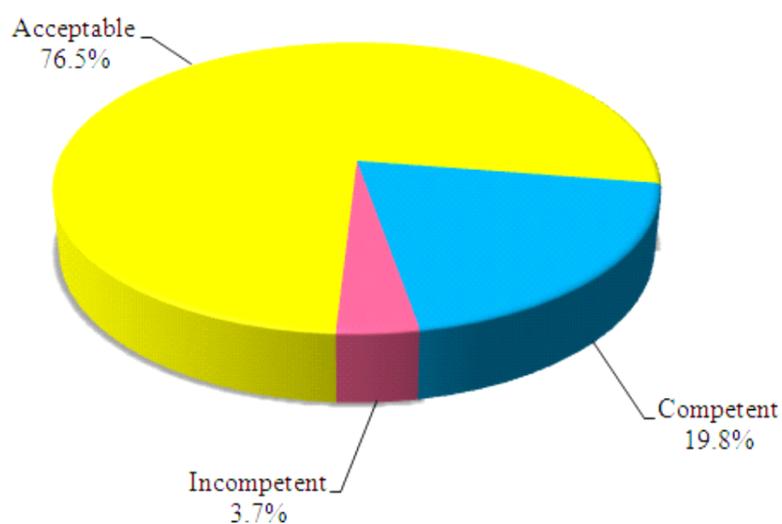
Figure (2): Nurses' overall practice regarding toxicological emergencies (n = 81)

Table 3: Correlation between studied nurses' knowledge and practices regarding toxicological emergencies (n = 81)

nurses' practices		nurse's knowledge				
		Definition of toxicological emergencies	Signs and symptoms of toxicological emergencies	Initial assessment of poisoning	Immediate intervention of poisoning	Overall Knowledge
Performing initial assessment	r	0.242	0.092	-0.006	0.186	0.195
	p	0.029*	0.414	0.956	0.096	0.081
Resuscitate the collapsed patients	r	0.343	0.149	0.135	0.174	0.264
	p	0.002*	0.185	0.231	0.119	0.017*
Immediate management for poisoned patients	r	0.362	0.166	0.202	0.307	0.377
	p	0.001*	0.138	0.071	0.005*	0.001*
Overall practice	r	0.374	0.165	0.163	0.262	0.339
	p	0.001*	0.141	0.145	0.018*	0.002*

r: Pearson coefficient

*: Statistically significant at p ≤ 0.05

DISCUSSION

Poisoning is a global social and medical epidemic that is often a primary cause of hospital visits and accidents. According to the World Health Organization, around 200,000 poison-related deaths occurred in 2012, with 80% of them occurring in low- and moderate-income countries (Asawari et al., 2017).

Concerning the demographic data results, the current study showed that nearly two thirds of nurses were female, more than half of them their age ranged from twenty to less than thirty years old. Additionally, nearly two thirds of them had technical institute of nursing. This explained that most of these nurses were newly graduated. Still, women

continue to lead the profession, and men make up a small percentage of those who work in nursing. According to educations nearly one third of them had technical institute of nursing this due to a lot of bedside nurses in governmental hospital had technical nursing degree while bachelor degree working ahead nurse and in administrator position.

Regarding work related data results, the current study revealed that the majority of the nurses worked in the emergency unit. This explained that the comprehensive of emergency unit to caring these patients. And staff qualification due to different diagnoses cases admitted to this word. Nearly half of the studied nurses their working experience ranged from five to less than ten years. This might be due to nearly half of the studied nurses above thirty years. Also, most of studied nurses join in training programs and majority of them get CPR training courses. This might be due to these courses are important for handling and managing patients with poisoning and saving their life.

Regarding the total nurses' knowledge, the results of the current study indicated that more than half of the nurses had poor overall knowledge concerning the toxicological emergencies. This result may be due to nearly two thirds of studied nurses had technical institute of nursing, lack of refreshment of knowledge, continuous training program and insufficient courses related to toxicological emergencies . This finding is supported by (Lafi, Kamali & Sharif, 2019*)* who demonstrated that, more than half of nurses had low knowledge regarding Food-Drug Interaction in the Intensive Care and Emergency Hospitals. .

Moreover, this finding is agreed with (Abebe, Kassaw, & Shewangashaw, 2019) who showed that nearly three-quarters of nurses had unsatisfactory knowledge on initial management of acute poisoning. Also, this finding is agreed with (Mohamed, 2020) illustrated that most studied nurses have unsatisfactory knowledge regarding organophosphate poisoning. On the other hand, the present finding is in contrast with (Abdallah, 2018) who reported that more than two thirds of studied nurses had good knowledge regarding initial management of poisoning.

Concerning the total nurses' practices the current study results showed that most of the nurses had acceptable level of practice about toxicological emergencies. This due to that nearly two thirds of the study nurses had technical institute of nursing, the majority of

nurses working in emergency department had adequate practices in management sever cases and due to recurrent and multiple cases of poisoning and nearly half of nurses have adequate experience in emergency unit and poisoning center carefully to saving patients life. This finding goes in the same line with the study done by (Mohamed, 2020) which showed that more than half of the nurses had competent practice regarding care of patients with acute organophosphate poisoning.

On the other hands this finding is disagreed with (Lekei et al., 2017) who stated that most of nurses are knowledgeable about the first aid care and treatment in cases of pesticide poisoning. Furthermore, this finding is contradicted with (Sayed et al., 2015) who found that all nurses had in adequate practices regarding detection and management of acute drug poisoning.

Regarding correlation between studied nurses' knowledge and practices about toxicological emergencies the present study results demonstrates that, there was a positive statistically significant correlation between studied nurses' overall knowledge and overall practice regarding toxicological emergencies. This might be attributed to lack of on-job training, absence in clinical guidelines or protocols in providing care to poisoned patients and lack of supervision. Other factor may include poor reinforcement from hospital administrators, insufficient medical resources, time limits and lack of communications between nurses and the hospital policy leaders. Moreover, the job description and responsibilities of nurses regarding toxicological emergencies still need to be determined. This finding is agreed with (Mohamed, 2020) who revealed that there was highly statistically significant correlation between nurses' knowledge and their level of practice regarding care of patients with acute organophosphate poisoning. On the other hand, this finding is disagreed with the study conducted by (Sayed et al., 2015) who revealed that no correlations between total scores of knowledge and total scores of practice regarding detection and management of acute drug poisoning.

CONCLUSION:

According to the findings of the present study, more than half of the studied nurses had poor overall knowledge about toxicological emergencies and most of the studied nurses had acceptable overall practice about toxicological emergencies. Also, there was a

positive statistical significant correlation between the overall nurses' knowledge and practices about toxicological emergencies.

RECOMMENDATIONS

The following recommendations are made considering the results of this study:

1. Continuous in-service training programs about toxicological emergencies should implemented to improve nurses' knowledge and practice.

2. Provides periodic training and evaluations for nurses to help them improve their practice and assess their knowledge about toxicological emergencies.

3. Encourage nurses' attendance to national and international conferences, workshops and continues training courses affiliated to the ministry of health related to nursing care for patient with poisoning.

4. Provide manual handbooks containing all necessary knowledge and practice about nursing care related toxicological emergencies.

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معلومات وممارسات ممرضي العناية الحرجة عن طوارئ التسمم

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الخلاصة

التسمم مشكله عالمية صحية عامة. ويعتبر واحد من الاسباب الرئيسية لدخول قسم الطوارئ. ولممرضة العناية الحرجه دور هام في تقييم مرضي التسمم. حيث أن المعرفه المبكره التابعه بالمعالجه الفعاله في المراحل الاوليه تزيد من معدل الحياه بين المرضي المسمومين. **الهدف من الدراسة::** تهدف إلي تقييم معلومات وممارسات ممرضي العناية الحرجة عن طوارئ التسمم. **مكان الدراسة:** مركز السموم في مدينة المنصوره وقسم الطوارئ في مستشفي المنزله المركزي وقسم الطوارئ في مستشفي السلام . **تصميم البحث:** تم إستخدام التصميم الوصفي للدراسة الحالية. **عينة الدراسة:** تتكون عينة البحث من 81 ممرض / ممرضه. **أدوات البحث:** تم استخدام أداتين لجمع هذه البيانات. الأداة الأولي: عبارة عن استمارة استبيان لجمع معلومات الممرضين عن طوارئ التسمم، الأداة الثانية: عبارة عن استمارة لملاحظة ممارسات الممرضين عن طوارئ التسمم. **النتائج:** أظهرت الدراسة أن الممرضين ليس لديهم المعلومات والمهارات الكافيه للتعامل مع مرضي التسمم حيث كان أكثر من نصف المرضين(54.3%) لديهم مستوى ضعيف من المعلومات عن العنايه بمرضي التسمم ولكن معظم الممرضين(76.5%) لديهم مستوي متوسط من المهارات فيما يخص بالرعايه التمريضيه بمرضي التسمم. **وقد أوصت الدراسة:** بإعطاء برنامج تدريبي لتحسين معلومات وممارسات الممرضات المتعلقه بالعناية بمرضي التسمم.

الكلمات المرشدة : معلومات الممرضين ، ممارسات الممرضين ، طوارئ التسمم.