Factors Affecting Nurses' Role Regarding Care of Patients with Acute Organophosphate Poisoning

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Abstract

Background: Acute organophosphate poisoning is a major health problem presents worldwide and is responsible for much mortality especially in developing countries. Early identification and effective management in the initial stages increase rate of survival among these patients. Nurses' role remains long standing determinates of quality care rendered for patients, many factors affecting nurses' role include physical, psychological, professional, patient related factors and work-related factors. So, nurses' play a core role in the management of acute organophosphate poisoning through closely monitoring of patients and providing quality nursing care. **Aim of the study** was to determine factors affecting nurses' role regarding care of patients with acute organophosphate poisoning. **Subjects and Methods: Research design:** A descriptive research design was carried out in this study **Setting:** The present study was conducted in emergency department and poisoning unit at Zagazig university hospitals S**ubjects:** A convenience sample of all available nurses (70). **Tool of data collection:** Two tools were used for collecting data: **Tool I:** A structured interview questionnaire about demographic characteristics of the studied nurses, nurses` knowledge, and factor which affect nurses' role. **Tool II:** Observational checklist to assess nurses' practices. **Results:** More than three quarters (75.7%) of studied nurses had unsatisfactory total knowledge, more than two thirds (68.6. %) of studied nurses had unsatisfactory total practice regarding care of patients with acute organophosphate poisoning and 67.1%, 58.6% & 77.1% of factors related to nurse, factors related to patient, and factors related to work respectively affected nurses' role regarding care of patients with acute organophosphate poisoning. **Conclusion:** There was a positive significant correlation between total knowledge, total practice, and factors affecting nurses' role. **Recommendation:** Training programs are recommended to improve nurses' knowledge and practice regarding care of patients with acute organophosphate poisoning. Factors affecting nurses' role should be evaluated by the nursing management and hospital administration to avoid or correct such factors.

Key words: Nurses' Role, Factors, Organophosphate Poisoning. Patient care

Introduction

Organophosphates (OP) are a class of organophosphorus compounds (OPCs) that are chemical substances produced by the process of esterification between phosphoric acid and alcohol. Organophosphate is one of the most used categories of synthetic pesticides in the field of agriculture and nerve agents in the chemical warfare. Every year millions of people are exposed to OP from accidental exposure and also used for suicidal and homicidal purposes. Nearly 80% of hospital admission in suicide cases is due to OP exposure **(1).**

Acute organophosphate poisoning occurs when the body is exposed to a toxic substance (OP) in a high dose, on one occasion and during a short period of time. Symptoms develop in close relation to the exposure **(2).** Organophosphate inhibits enzyme acetylcholinesterase, increasing acetylcholine in muscarinic and nicotinic receptors in the peripheral and central nervous systems causing widespread clinical symptoms as miosis, bronchorrhea, diarrhea, bradycardia, fasciculations, and tachyarrhythmias. Patients with severe OP poisoning usually have clinical manifestations including disturbance of consciousness,

respiratory failure, toxic shock, and gastrointestinal dysfunction. Respiratory paralysis and cardiac arrest are the most common causes of death in acute OP poisoned patients [(3)].

Early management of organophosphate poisoning can be lifesaving. Management involves resuscitation, antidote, gastric decontamination, and supportive care. Immediate assessment and stabilizing the airway, breathing, and circulation is one of the keystones in management [(4)].

Nurses are typically the first health care providers to contact patients who have consumed poisons. Knowledge and skills, of nurses are critical to their practice and have a significant impact on the overall patient outcome [(5)].

Nurses' role has a direct impact on health care productivity. Several factors affect the nurses 'role including environmental factors, organizational factors, patient related factors and nurse related factors. The most recent information on nursing posts in country is that nurses make up the largest number of health care workers in the public health sector. In the nursing organization, the nursing competency is associated directly with nursing performance, sufficient knowledge and skills and appropriate judgment lead to the qualitative improvement of nursing, resulting in the successful achievement of the organizational goal [(6)].

Significance of the study:

The incidence of organophosphate poisoning has increased rapidly recently and affects the patient's condition quickly. In Egypt, OP poisoning is a common cause of morbidity and mortality and represents more than 50% of patients with insecticide poisoning [(7)]. Nurses' role mainly reflected quality of care provided for patients. Evidence revealed that competent, motivated, and skilled nurses are cornerstone for better performance of health care organizations. Research report shows several factors affect the nurses' role level. The dearth of nurses or equipment and supplies in health care system poses workload on nurses and reduces individuals' performance which in turn will be an obstacle for achieving optimum patient care. So, the current study was carried out to determine factors affecting nurses' role regarding care of patients with acute organophosphate poisoning [(8)].

Aim of the study: Was to determine factors affecting nurses' role regarding care of patients with acute organophosphate poisoning.

The aim achieved through the following objectives:

-Assess nurses' knowledge regarding care of patients with acute organophosphate poisoning.

-Assess nurses' practice regarding care of patients with acute organophosphate poisoning.

-Determine factors affecting nurses' role regarding care of patients with acute organophosphate poisoning.

Operational definitions:

Role: The term role refers to the act of carrying out or doing. It is an execution, accomplishment or achievement. For the purpose of this study, role of nurse means knowledge and practice of the nurse regarding care of patient with acute organophosphate poisoning.

Patients care: It is the health care services provided by nurses that meet patients' physical, psychological and spiritual needs, and also meets the professional standards.

Factors:

Facts or situations that influence the resul t of something. In this study, the term factor was used to refer to nurse, patient, and work-related factors that affecting on the role of nurses**.**

Research Questions:

-What is the level of nurses' knowledge regarding care of patients with acute organophosphate poisoning?

-What is the level of nurses' practice regarding care of patients with acute organophosphate poisoning?

-What are the factors affecting nurses' role regarding care of patients with acute organophosphate poisoning?

Subjects and methods:

Research design:

A descriptive exploratory design was used. Descriptive research is usually defined as a type of quantitative research, though qualitative research can also be used for descriptive purposes. The research design should be carefully developed to ensure that the results are valid and reliable. Descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends, and categories McCombes [(9)].

Study setting:

The present study was conducted in emergency department and poisoning unit at Zagazig University Hospitals. Emergency department present on the first floor of Emergency Hospital composed of four parts. Poisoning unit present on the third floor of Cardiothoracic Sidnawi Hospital, consisted of three rooms, each room contain three beds.

Study subjects:

A convenient sample of all available nurses (70) working in in emergency department and poisoning unit at Zagazig University Hospitals.

Tools of data collection:

Two tools were used to collect necessary data.

Tool I: Self-administered questionnaire: Composed of three parts:

Part I: Used to assess demographic characteristics as: age, gender, marital status, educational qualifications, residence, income, unit of working, years of experience in the nursing filed, years of experience in working unit and attendance of any training courses (10 closed ended questions) Mohamed, et al [(7)].

Part II: Used to assess nurses' knowledge regarding care of patients with acute organophosphate poisoning including two different sections, nurses' knowledge about acute OP poisoning Joy, et al [(10)] and nurses' knowledge about care of patients with acute OP poisoning Mohamed, et al [(7)]. (51 MCQ & True and False questions). The total score for the knowledge was 51 grades (100%). Each complete correct answer scored one grade, zero for incorrect answer or don't know. For each area of knowledge, the score of the items was summed- up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 75% and unsatisfactory if less than 75% based on statistical analysis.

Part III: Factors affecting nurses' role: Used to assess factors affecting nurses**'** role regarding care of patients with acute OP poisoning, including factors related to nurse, factors related to patient and factors related to work. Which adapted from Gouda, et al [(11)] & Ullah, et al [(12)] and modified by the researcher to suit aim of the study**.** This tool consisted of three items were factors related to nurse included 36 points, factors related to patient included 9 points and factors related to work included 36 points. The total score of the factors was 81 grades (100%). The responds to these statements were on two scales as follows: one point for affected, zero point for not affected. Total score for whole factors assessment tool was calculated for every nurse and the mean of total score was calculated. These scores were converted into percent scores. The nurses' role was affected with this factor when the total score equal or above 75% and not affected when the total score below 75% based on statistical analysis.

Tool II: Observational checklists for nurses: It was used to assess nurses' practices regarding care of patients with acute organophosphate poisoning. Attenuated observational checklist was developed by the researcher. It consisted of seven parts: Emergency assessment and immediate intervention ABCDE **(**36

items) Parsons et al [13] & Harding et al [14]. Skin decontamination WHO [15]. Gastric lavage (24 items) Paul et al [16]. Shock assessment and management (21 items) Harding et al [14]. Intravenous therapy practice (45 items) WHO [17]. Oropharyngeal airways suction (28 items) and an endotracheal tube suction: open system (27 items) Perry & Potte [18]. The total score of the practice was 196 grades (100%). The items observed to be done were scored one and the items not done were scored zero for each area. The score of the items were summed-up and the total divided by the number of the items. These scores were converted into percent scores. The nurses had satisfactory level of practice when the total score was equal or above 75% and unsatisfactory if it was below 75% based on statistical analysis.

Content validity& Reliability:

The tools were revised by a panel of 3 experts from nursing staff which included one professor and two assistant professors medical surgical nursing at Zagazig University that revised the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. All recommended modifications were done. Reliability was measured by Alpha Cronbach for knowledge questionnaire was 0.735. Reliability of practice checklist was 0.912, while factors that affect nurses' role were 0.937.

Fieldwork

Once the approval was granted to progress in the study, the researcher started to organize a schedule for collecting the data. The researcher visited study setting to be familiar with work process, time of work and observe nurses attending the study settings to a set schedule for data collection. The researcher used to go to the study setting for interviewing the nurses. The purpose of the study was explained to each nurse individually, and then the nurses were asked to participate in the study. Each nurse observed for 2 shifts at morning and afternoon then the nurses were asked to fulfill the questionnaire sheet, the time used for finishing the self-administered questionnaire ranged between 20-30 minutes, also the researcher was observing nurses' practical skills about studied procedure. The time needed to complete the checklist ranged between 30-45 minute. The time needed to complete the checklist depended upon the time of the procedure and filled by the researcher during nurses' performance inside the department. The fieldwork was executed over the period from November 2021 to April 2022. The researcher was available 2 day at Zagazig University hospital.

Pilot study:

A pilot study for tools of data collection was carried out to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected seven (10%) nurses random to participate in the pilot testing of the questionnaire sheet and checklist from emergency department and poisoning unit and not excluded from the study sample because of no modifications in the tool.

Administrative and ethical considerations:

An official permission for data collection in Zagazig University was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing Zagazig University explaining the aim of the study to obtain permission and help.

At the interview, each subject (nurses) was informed about the purpose, benefits of the study, and

nurses were informed that participation was voluntary, and they had right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected would be confidential and used only to improve nurses' knowledge and practice for the purpose of the study.

Statistical analysis:

All data were collected, tabulated, and statistically analyzed using IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. Quantitative data were expressed as the mean ± SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Pearson's correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. p-value < 0.05 was considered statistically significant (S), p-value < 0.001 was considered statistically significant (HS) and p-value ≥ 0.05 was considered statistically insignificant (NS).

Results:

The demographic characteristics of the nurses in the study sample **Table 1:** Revealed that more than half of studied nurses (54.3%) more than 30 years old ranged from 20-55 with mean ±SD=34.9±10.4. About two thirds (62.9%) of studied nurses were females, nearly three quarters (71.4%) of them were married. Regarding nurses' qualification, 54.3% of studied nurses had diploma degree in nursing sciences, more than half (57.1%) of nurses affiliated to emergency unit, slightly less than one half of them had experience equal or more than 15 years in the nursing field, and more than half (55.7%) of nurses had experience in the current unit more than five years.; Furthermore; 62.9% of studied nurses hadn't attended any training courses regarding care of patients with acute OP poisoning.

Table 2: According to level of nurses' knowledge regarding care of patients with acute organophosphate poisoning, the study finding revealed that more than three quarters (75.7%) of studied nurses had unsatisfactory level of total knowledge regarding care of patients with acute organophosphate poisoning. with mean± SD 33.26±5.4 and ranged from 22-44.

Table 3: As regards to level of nurses' practice, the study finding revealed that 68.6% of studied nurses had unsatisfactory level of total practice regarding care of patient with acute organophosphate poisoning with mean ± SD 133.67±20.39.

Table 4: Illustrates frequency distribution of factors affecting nurses' role regarding care for patients with acute organophosphate poisoning. This table defined that 67.1%, 58.6%& 77.1% of factors related to nurse, factors related to patient, factors related to work respectively affected nurses' role regarding care of patients with acute organophosphate poisoning.

Table 5: Concerns with matrix correlation of total knowledge with total practice, total factors, age, total years of experience and experience years in the current unit, the study finding revealed that there was a statistically positive significant and direct correlation between total knowledge with total practice and total factors with p-value was 0.0001. Also, there was a statistically significant and direct

correlation between total practice and total factors affecting nurses' role with p-value was 0.0001.

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Discussion:

Regarding to demographic characteristic of the studied nurses, the result of the present study revealed that more than half of studied nurses had more than 30 years old. This result was in the same line with Sayed, et al [19] who found that about two third of studied nurses had more than 30 years old.

As regard to gender, the current study results revealed that more than two third of studied nurses were females and married. This may be due to those faculties and institutions of nursing in Egypt were restricted to females in previous centuries so that nursing workforce is still more feminine. This finding was on the same line with that of Saad, et al [21] who reported that more than two third of studied nurses were females.

Regarding to qualification of studied nurses, the result of present study revealed that more than half of them had diploma degree in nursing sciences. This finding might be related to decreased number of high graduated nurses attached and working at zagazig university hospitals. This finding was in harmony with Khalil, et al [20] who stated that nearly three quarters (72.7%) of studied nurses were had a diploma degree in nursing.

Regarding unit of working, the current study revealed that nearly two third of studied nurses worked in the emergency department. This may be due to the comprehensive of this unit to caring these patients. This finding was in harmony with Saad, et al [21] who reported that the majority of studied nurses worked in the emergency unit.

Concerning years of experience, the study findings revealed that more than half of studied nurses had experience more than five years in the working unit. This was in agreement with Sayed, et al [19] who found that more than half of studied nurses had 5-10 years of experience.

Regarding previous attendance of training courses about care of patient with acute OP poisoning, the study findings reported that more than two third of studied nurses hadn't previously attended any training courses. This might explain the deficiencies in their knowledge, and practice and may be due to unaccessibility of training courses throughout the hospital management. This result was on the same line with that of Beyene, [22] who stated that most of studied nurse hadn't previously attended training courses related to emergency and poisoning management.

As regard total nurses' knowledge, more than three quarters of studied nurses had unsatisfactory knowledge level regarding care of patients with acute organophosphate poisoning. This result was on the same line with that of Mohamed, et al [7] who stated that nearly three quarters of studied nurses had unsatisfactory knowledge level regarding care of patients with acute organophosphate poisoning.

Concerning total nurses' practices regarding care of patients with acute organophosphate poisoning. The study findings revealed that more than two third of studied nurses had unsatisfactory total practice regarding care of patients with acute organophosphate poisoning. These results are matched with Beyene [22] who stated that all studied nurses had unsatisfactory practice regarding initial management of acute poisoning.

This result was not correspondent with Mohamed, et al [7] who reported that more than half of studied nurses had competent level of practice regarding care of patient with acute OP poisoning.

Knowledge is very important to improve practice, so this finding may relate to knowledge deficit about acute OP poisoning, lack of bachelor graduate among studied nurses, lack of training courses to nurses, work overload, lack of medical education about acute OP poisoning, lack of standardized nursing care procedure or no availability of manual book which contain all nursing procedure about care of patients with poisoning.

Regarding to factors affecting nurses' role. The current finding revealed that nearly three quarters of studied nurses their role regarding care for patients with acute organophosphate poisoning was affected by nurse, patient and work-related factors. This result was in the same line with Said, et al [23] who presented that the majority of the studied nurses their performance was affected by several factors.

Controversy with Mohamed, et al [24] who illustrated those four fifths of studied nurses their performance was not affected by organizational issues, environment and equipment and the pressures facing nursing staff.

Concerning with correlation of total knowledge with total practice. There was highly statistically significant positive correlation between total knowledge and total practice among studied nurses. This might be the nurses should have knowledge to provide care for poisoned patient. This result was in harmony with Mohamed, et al [7] who reported that there was highly statistically significant correlation between nurses' knowledge with their level of practice regarding care of patients with acute OP poisoning.

Finally, analysis of data in the current study showed that, the most of studied nurses their role regarding care for patients with acute organophosphate poisoning affected by factors related to nurse, factors related to patient and factors related to work.

Conclusion:

Based on the results of the present study, it could be concluded that, more than three quarters of studied nurses had unsatisfactory total knowledge and more than two thirds of studied nurses had unsatisfactory total practice regarding care of patients with acute organophosphate poisoning. Nearly three quarters of studied nurses their role affected by nurses, patient, and work-related factors. As well as there was a statistically significant relation between total nurses' knowledge and total nurses' practice. There was a statistically significant relation between total nurses' practice and total factors related to nurse, patient and work organization.

Recommendations:

In view of the main results of the study the following recommendations were derived and suggested, training programs are highly recommended to improve nurses' knowledge and practice regarding care of patients with acute organophosphate poisoning. Standard nursing procedures booklet should be available to guide nurses giving the adequate care for patient with acute organophosphate poisoning to prevent complication and mortality due to poisoning. The factors affecting nurses' role should be evaluated by the nursing management and hospital administration to avoid or correct such factors. Further study is proposed to evaluate the effect of educational program on nurses' role regarding care for patients with acute organophosphate poisoning.

Table 1: Frequency and percentage distribution **of** demographic characteristics of the studied nurses (n=70)

Demographic Characteristics	No	%
Age		
≤30	32	45.7
>30	38	54.3
Mean ±SD	34.9±10.4	
Median (range)	31(20-55)	
Gender		
Males	26	37.1
Females	44	62.9
Marital status		
Married	50	71.4
Single	20	28.6
Nursing Qualification		
Diploma	38	54.3
Technical institute	19	27.1
Bachelors	13	18.6
Residence		
Rural	49	70.0
Urban	21	30.0
Income		
Sufficient	32	45.7
Insufficient	38	54.3
Working unit		
Emergency department	40	57.1
Poisoning unit	30	42.9
Nurses' total experience/years		
<15 years	36	51.4
≥15 years	34	48.6
Mean ±SD	14.94±11.06	
Median (range)	14(1-37)	
Nurses' experience years in the current unit/ years		
≤5 years	31	44.3
>5 years	39	55.7
Mean ±SD	9.27±8.45	
Median (range)	7(1-33)	
Training		
Yes	26	37.1
No	44	62.9

Table 2 Distribution of total nurses' knowledge regarding care of patients with acute organophosphate poisoning (n=70):

Total Items of Knowledge	Satisfactory ≥75%		Unsatisfactory<75%		Mean ± SD	Median (range)
	No	%	No	%		
Nurses' knowledge about acute organophosphate poisoning	6	8.6	64	91.4	11.68±3.2	12(5-19)
Nurses' knowledge about care of patients with acute organophosphate poisoning	28	40.0	42	60.0	21.61±3.88	21.5(11-29)
Total	17	24.3	53	75.7	33.26±5.4	33(22-44)

Table 3: Distribution of total satisfactory nurses' practice regarding care of patients with acute organophosphate poisoning (n=70):

Total Items of Practice	Satisfactory ≥75%		Mean ±SD	Median (Range)
	No	%		
Emergency assessment and immediate intervention (ABCDE):				
Airway	34	48.6	5.06±1.83	5(1-7)
Breathing	26	37.1	3.2 ±1.21	3(0-5)
Circulation	48	68.6	5.81 ±1.56	6(0-8)
Disability	19	27.1	2.53±1.49	3(0-5)
Exposure	15	21.4	6.49±2.54	6(1-11)
Total emergency assessment and immediate intervention	15	21.4	23.06±5.13	24(8-34)
Decontamination:				
Skin decontamination	31	44.3	10.73±3.03	11(4-15)
Gastric lavage	42	60.0	18.37±3.13	18(10-24)
Total decontamination	38	54.3	29.11±5.02	30(17-39)
Shock assessment and management	17	24.3	13.14±3.33	13(6-20)
Intravenous therapy practice	11	15.7	26.43±5.38	27(13-38)
Oropharyngeal airways suction	38	54.3	21.01±3.8	21(12-28)
An endotracheal tube suction	40	57.1	20.46±5.06	22(6-27)
Total nurses 'practice	22	31.4	133.67±20.39	134.5(82-174)

() * maximum score

Table 4: Frequency distribution of factors affecting nurses' role regarding care of patients with acute organophosphate poisoning (n=70)

Items of Factors	Affected≥75%		Not affected<75%	
	No.	%	No.	%
Factors related to Nurse	47	67.1	23	32.9
Mean± SD	27.73±7.53			
Range	30 (8-36)			
Factors related to patient	41	58.6	29	41.4
Mean± SD	6.43±2.57			
Range	7(0.00-9)			
Factors related to work	54	77.1	16	22.9
Mean± SD	29.76±9.49			
Range	34 (3-36)			
Total factors affecting nurses' role	51	72.9	19	27.1
Mean± SD	67.43±16.1			
Range	73.5 (11-81)			

Table 5: Matrix correlation of total knowledge with total practice, total factors, age, total years of experience and years of experience in the current unit of studied nurses (n=70)

Items	**Total Knowledge**					
			Total Practice		**Total Factors**	
	(r)	p-value	(r)	p-value	(r)	p- value
Total Knowledge	1					
Total Practice	0.375*	0.001	1			
Total Factors	0.482*	0.0001	.419*	0.0001	1	
Age per years	-0.185	0.125	-0.064	0.6	-0.129	0.286
Nurses' total experience years	-0.213	0.077	-0.117	0.335	-0.167	0.167
Experience in the current unit/ years	-0.267*	0.025	0.204	0.09	-0.106	0.382

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