

## Impact of Nursing Intervention Protocol about Polytrauma Care during the Golden Hour on Nurses' Performance

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### Abstract:

**Background:** The golden hour following a traumatic event is characterized by the need for rapid assessment and immediate resuscitation treatment, which represent the fundamental principles of Advanced Trauma Life Support. **Aim:** This study aimed to assess the impact of nursing intervention protocol about polytrauma care during the golden hour on nurses' performance. **Research hypothesis:** This study was hypothesized that the nurses' knowledge and practice will be significantly improved after implementing nursing intervention protocol. **Research Design:** A quasi-experimental design study with one group pre-test post-test approach was used to achieve the aim of the present study. **Setting:** it was conducted at Emergency departments affiliated to Ain Shams university hospitals. **Subjects:** A Convenient sample of all available nurses (thirty) working in Emergency departments. **Tools:** I- Self-administered nurses' polytrauma care knowledge questionnaire, it was used to assess nurses' knowledge regarding management of patient with polytrauma during the golden hour and II- Nurses' polytrauma care practice observational checklist: to assess nurses' practice regarding management of patients with polytrauma during the golden hours. **Results:** it was found that two thirds of the nurses were between twenty five to forty years, and less than half of them were graduated from nursing institute. There were highly statistically significant differences in knowledge and practice regarding care of patients with polytrauma during the golden hour with marked improvement post implementation among studied nurses. There was a significant relation between studied nurses' knowledge & practice and gender & education. **Conclusion:** there was an improvement in knowledge and practice post nursing intervention protocol implementation among studied nurses with statistically significant differences between pre- and post- knowledge, and practice. **Recommendations:** Replication of the study on a large probability sample for results generalization and Improve and update nurses' knowledge and skills about management of patients with polytrauma during the golden hour.

Keywords: polytrauma, nursing intervention, performance, golden hour.

### Introduction

Every day, individuals are brought to emergency rooms or trauma centers with multiple injuries as a result of traumatic events such as car or motorcycle crashes or other high-energy impacts to the body, including falls from heights, crush injuries, or gunshots. A

person involved in a traumatic event who has sustained multiple injuries is a polytrauma patient. Trauma is one of the main causes of disability in adults of working age, with over 45 million people worldwide experiencing moderate to severe disability secondary to trauma

every year. Not only does trauma have severe consequences for the economy, it also has many ongoing effects to the individual (*Aaron & Schraye, 2016*).

According to the World Health Organization (WHO) and the Center for Disease Control and Prevention data, more than nine people die every minute following a traumatic event and every year 5,800,000 individuals of all ages and social classes die from intentional or non-intentional lesions. Traumatic injuries represent 12% of all diseases worldwide (*O'Connell, et al., 2018*).

Polytrauma was defined as a "syndrome of multiple injuries exceeding a defined severity (Injury Severity Score (ISS >17) with sequential systemic traumatic reactions that may cause dysfunction or failure of remote organs and vital systems, which had not themselves been directly injured (*Urden, 2014*).

Polytrauma involves injuries to several body regions and not only compromises the patient's physical health but also potentially causes dysfunction to their uninjured organs. Because of their multiple injuries, individuals with polytrauma are at a risk of higher morbidity and mortality rates than if they had just sustained a single injury. Polytrauma injuries also commonly lead to physical, cognitive, psychological, psychosocial, and functional impairments, as well as disabilities. Therefore, management of the patient with polytrauma involves highly focused specialist care and a multidisciplinary team approach with extensive rehabilitation (*Mohamed, Ahmed & Mahmoud, 2019 and Mauk, 2012*).

Trauma is time-sensitive, where delay in definitive care of a few minutes may mean the difference between life and

death. One of the most fundamental tenets of trauma care is the 'Golden Hour'. This term was coined to emphasize the importance of providing definitive care to trauma patients as quickly as possible. It represents the first peak in the trimodal distribution of trauma mortality in which majority of trauma deaths occur within the first hour after the accident (*Pham, Puckett, & Dissanaik, 2017*).

The first 60 minutes after traumatic injury which is the most crucial period that determines the patient's outcome has been termed the "golden hour." The concept that definitive resuscitative trauma care must be initiated within this early window has been publicized, taught, and practiced worldwide for more than four decades. The main steps in the early management of trauma are primary assessment; resuscitation which is performed together; reassessment of airway, breathing, and circulation; and secondary assessment (*Abhilash, and Sivanandan, 2020*).

The primary assessment provides basic data essential for the patient's survival when life or limb is threatened. Resuscitation should be initiated simultaneously with the primary assessment. It is performed when any component of the primary assessment appears unstable. The secondary assessment is to be performed after the completion of primary assessment and resuscitation. It provides comprehensive information about the various organ systems (*Abhilash, and Sivanandan, 2020*).

Nursing care in cases of emergency trauma requires the health services and professionals to use a variety of practices, to meet the high complexity and seriousness presented by violence or accident victims, who need specific

health actions/interventions (*Mohamed, Ahmed & Mahmoud, 2019*)

Multidisciplinary care of the patient who has suffered polytrauma is complex. Treatment depends on many factors, including the physical injuries, any consequent emotional or psychological trauma, changes in the individual's level of functioning, and in severe cases, changes in the patient's status within the community. Nurses are involved not only in the treatment of the individual, but also in the education and care of their family and friends, which due to circumstances surrounding the trauma, may be very intense. Nursing care of the individual will be dependent on their physical injuries, but will also involve their emotional, psychological, and psychosocial needs (*Mauk, 2012*).

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

Polytrauma is generally used to describe trauma patients whose injuries involve multiple body regions, compromise the patient's physiology, and potentially cause dysfunction of uninjured organs. The expected higher risk of mortality of polytrauma patients assumes /that the underlying pathophysiological response of the injured person would aggravate the clinical outcome (*Paffrath, Lefering, and Flohe, 2014*). Implementing nursing intervention protocol for nurses caring for patients with polytrauma during golden hour is very important to improve patients' outcomes, decrease cost, decrease mortality and morbidity

### **Aim of the Study:**

This study aimed to assess impact of nursing intervention protocol about polytrauma care during the golden hour on nurses' performance through the following:

1. Assess the nurses' level of knowledge regarding management of patient with polytrauma during golden hour.

2. Assess the nurses' level of practice regarding management of patient with polytrauma during golden hour.

3. Assess impact of nursing intervention protocol about polytrauma care during the golden hour on nurses' knowledge and practice.

### **Research hypothesis:**

This study was hypothesized that

- The nurses' knowledge will be significantly improved after implementing nursing intervention protocol, compared to their pre-knowledge level.

- The nurses' practice will be significantly enhanced after implementing nursing intervention protocol, compared to their pre-practice level.

### **Subjects and methods:**

#### **Research Design:**

A quasi-experimental design study with one group pre-test post-test approach.

#### **Setting:**

The study was conducted at Emergency departments affiliated to Ain Shams university hospitals. Emergency department of Ain Shams Specialized hospital which included 14 beds and isolation room. In relation to Emergency department of emergency hospital (El Demerdash), it contains medical and surgical departments. The medical department contain five equipped rooms with defibrillator, crash cart, three beds and one monitor but the surgical

department contain one big room equipped with eleven beds, defibrillator, crash cart and one monitor and the other two rooms equipped with three beds, defibrillator and crash cart.

### Subjects:

A Convenient sample of all available nurses (30) working in the previously mentioned study setting, who were caring for patients with polytrauma and agreed to participate in the study.

### Tools for data collection:

Two tools were used to collect data of this study:

#### I- Self-administered nurses' polytrauma care knowledge questionnaire:

This tool was developed by the researchers in Arabic language to assess nurses' knowledge regarding management of patient with polytrauma during the golden hour based on the relevant and recent literatures (*Smeltzer and Bare, 2016 ; Urden, Stacy, and Lough 2014*). It was included two parts:

**The first part:** General characteristics, was used to assess demographic data of nurses under study regarding age, gender, qualification, years of experience.

**The second part:** This part was concerned with assessment of nurses' knowledge regarding management of patients with polytrauma during the golden hour. It included general knowledge regarding trauma (5 items), causes of trauma (4 items) preparation for receiving of patients with polytrauma (6 items), air way assessment (5 items), breathing assessment (7 items), circulation assessment (3 items),

neurological assessment (3 items), environmental safety (3 items), and Nurses' knowledge regarding nursing care of patients with polytraumatic injury, (14 items).

**Scoring system:** - The nurses' total level of knowledge is consisted of 50 items. Each item was given 0 score value for incorrect response and 1 score value for correct one. A subtotal & total mean for nurses' knowledge was categorized into unsatisfactory or satisfactory knowledge level as follows:

- <75% (< 37.5 marks) was considered unsatisfactory.

- ≥75% (≥ 37.5 marks) was considered satisfactory.

#### II- Nurses' polytrauma care practice observational checklist:

This tool was developed by the researchers in English language based on reviewing the recent and relevant literatures (*Schilling, 2017; and Ignatavicius, Workman, Jones & Toulson, 2013*) to assess nurses' practice regarding management of patients with polytrauma during the golden hours.

It included practice regarding primary survey (including, assessment of airway (15 items), breathing (4 items), circulation (8 items), disability and neurological assessment (10 items), assessment of Glasgow coma scale (15 items) and exposure & environment (3 items), secondary survey which included History taking (11 items) and head to toe assessment (24 items) and immediate nursing interventions as assisting in intubation, oxygenation, suction, insert vascular access and administering medications (12 items).

**Scoring system:** The scoring system was utilized when the step done correctly scored (1) while for not done /not correctly done scored (0). A subtotal & total competent level of nurses' practice was categorized into satisfactory or unsatisfactory practice as follows:

- <80% was considered unsatisfactory practice.

-  $\geq$  80% was considered satisfactory practice.

**Testing validity** of the study tools (face and content validity).

Face validity aimed to inspect the items to determine whether the tools measure what it supposed to measure. While content validity was done to determine whether the tool achieve the study aim. The tools were evaluated by Validity was tested through a jury of (5) experts from Medical Surgical Nursing Department, Ain Shams University. The tools were reviewed for to evaluate the clarity, relevance, comprehensiveness, simplicity, and applicability. No modifications were done.

**Testing reliability:** It was done using alpha Cronbach's test to examine the internal consistency of the tools. The values of alpha Cronbach's test were (0.85 & 0.97) for nurses' knowledge questionnaire and practice checklist respectively indicating acceptable reliability.

**Pilot study:** was conducted on 10% (3) of the studied nurses to test the applicability of the data collection tools, the clarity of included questions as well as the average time needed to complete the tools. No modifications were done, and the nurses were included again in the study. Results obtained were studied and analyzed accordingly. Modifications were

made for the final development of the tools, the studied nurses who included in the pilot study were excluded from the study subjects.

#### **Nursing intervention protocol booklet for caring of patients with polytraumatic injury during the golden hour:**

The researchers were designed polytrauma nursing intervention protocol based on the updated nurses' educational needs. In addition to the recent medical and nursing textbooks and the related literature ((*Black & Hawks, 2018; Smeltzer, Hinkle, Bare, and Cheever, 2017; Carpenito-Moyet & Canellos., 2010*) to review core components of nursing management of polytrauma during the golden hour.

The protocol consisted of theoretical part and practical skills for nurses. The protocol was tested for validity by 5 experts in the Faculty of Nursing- Ain Shams University for clarity and comprehensiveness.

#### **Theoretical part which is consisted of:**

- General knowledge regarding patients with polytrauma during the golden hour.
- Causes of polytrauma.
- Preparation for receiving of patients with polytrauma.
- Primary and secondary survey.
- Air way, breathing, circulation, and neurological assessment.
- Environmental safety.

- Nurses' knowledge regarding management of patients with polytrauma during the golden hour.

**Practical part which is consisted of practice regarding:**

- Primary assessment (ABCDE assessment and Glasgow coma scale)

- Secondary assessment (history taking and head-to-toe assessment).

- Immediate nursing interventions regarding management of patients with polytrauma during the golden hour.

**Field work:**

- An approval was obtained from hospital directors and nursing directors.

- Data collection was started in June 2019 to January 2020.

- Data were collected by the researcher three days per week during morning and afternoon shift.

- An introductory interview was conducted with the nurses who agreed to participate in the study and purpose of the study was simply explained to them prior to any data collection.

- The subjects were divided into small groups about 3-5 nurses for each group to avoid interference with the patient care at the emergency department.

- Information related to demographic data was collected.

**Pre-assessment:**

- A pre-test of nurses' practice was observed by the researchers before implementation of the intervention protocol using tool II during care of patients with polytrauma, to be used as baseline data for latter comparison with the post-test.

- A pre-test nurses' knowledge questionnaire (tool I) was used to assess

the studied nurses' knowledge level to be used as baseline data to be compared with the post-test. It resumed about 30 minutes to be completed and the researcher was present to clarify any needed information.

**Planning phase:**

The Nurses intervention protocol was designed based on analysis of the actual nurses' needs in pre-assessment by using the previously constructed tools. The content was written in simple Arabic language and based on the related literatures, and consistent with their level of understanding.

**Implementation phase:**

- Nurses intervention protocol was implemented as follows:

- Theoretical sessions were done at the workplace. It was done through 6 sessions for each group of nurses to cover the previously mentioned items that illustrated in the booklet. The booklet was given to each nurse. The duration of each session was 40- 50 minutes plus 10 minutes for discussion, using the PowerPoint presentation and videos.

- Practical sessions were done through clinical demonstration and re-demonstration of the procedures which conducted at the workplace. 6 practical sessions were done for each group about the care of the patients polytrauma during the golden hour. These sessions were done within 1-2 hours according to each procedure, followed by summary of the procedures and discussion for any arised question.

**Evaluation phase:**

- Evaluation of studied nurses' knowledge was done using the pre/post-test questionnaire (*part two in tool I*)

immediately after ending of the Nurses intervention protocol. Its results were compared with the pre- test results.

- Evaluation of studied nurses' practice were done using (*tool II*) immediately after ending of the nursing intervention protocol, this done during their shifts at the emergency department.

#### **Administrative design:**

Approvals were obtained from the medical and nursing directors of emergency departments affiliated to Ain Shams university hospitals in which the study was conducted. The purpose of the study was explained to the nurses before conducting the study and oral consent was obtained from them to participate in the study.

#### **Statistical design:**

Data obtained were organized, categorized, and analyzed using SPSS (Statistical Program for Social Science). Data were presented in tables and charts using numbers and percentages. The

statistical analysis included percentage (%), mean and standard deviation (SD), range, percentage, chi-square ( $X^2$ ), ANOVA test (F-test) and Pearson coefficient (r). The observed differences, and associations were considered statistically significant at  $P < 0.05$ . Significance of results was described as follows: Nonsignificant (NS) difference obtained at  $p > 0.05$ , Significant (S) difference obtained at  $P < 0.05$  and highly significant (HS) difference obtained at  $P < 0.001$ .

#### **Ethical considerations:**

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The ethical considerations in this study include the following:

The researcher was clarified the aims of study to the nurses included in the study. and assured maintaining anonymity and confidentiality of the subjects' data. Nurses were informed that they had the choice to participate or not in the study and that they had the right to withdraw from the study at any time. Ethics, culture, values, and beliefs were respected.

## Results

**Table (1): Number and percentage distribution of general characteristics among the studied nurses (n=30).**

Items	No.	%
<b>-Age</b>		
• Less than 25	10	33.33%
• 25-40	20	66.67%
Mean ± SD	28.67± 4.714	
<b>-Gender</b>		
• Males	14	46.67%
• Females	16	53.33%
<b>-Marital status</b>		
• Single	14	46.67%
• Married	16	53.33%
<b>-Educational Level</b>		
• Diploma	10	33.33%
• Nursing Institute	14	46.67%
• Bachelor's degree	6	20.00%
<b>-Years of Experience</b>	Min 2    Max 20	
<b>-Training Courses</b>	Mean ±SD 7.53±5.26	
<b>-Training Courses</b>		
Yes	4	86.67%
No	26	13.33%
<b>-Benefits from Training Courses, application in work</b>		
Yes	4	86.67%
No	26	13.33%

Table 1 clarifies the demographic characteristics of the nurses included in the study, the results represents that, 66.67% of the nurses were between 25-40 years, 53.33% were females, 53.33% were married. In relation to educational level 46.67% were graduated from nursing institute and 42.5% had experience mean  $7.53 \pm 5.26$  years. 86.67% of them did not attended training courses and 13.33% of them attended training and gained benefits from it.

**Table (2): Difference between the nurses' satisfactory knowledge level regarding caring for patients with polytrauma during the golden hour pre and post implementation of nursing intervention protocol (n=30)**

Items	Pre-intervention (30)		Post-intervention (30)		X <sup>2</sup>	P- Value
	No.	%	No.	%		
General knowledge regarding trauma	16	53.33	30	100	18.26	0.000
Causes of trauma	4	13.33	26	86.67	32.27	0.000
Receiving of patients	4	13.33	24	80.00	26.78	0.000
Air way assessment	8	26.67	29	96.67	31.9	0.000
Breathing assessment	4	13.33	25	83.3	29.43	0.000
Circulation assessment	0	0.0	25	83.33	42.85	0.000
Neurological assessment	0	0.0	22	73.33	34.74	0.000
Environment safety	2	6.67	18	60.00	19.20	0.00005
Nursing management	14	46.7	26	86.7	10.8	0.001
Total knowledge scale	0	0.0	29	96.67	56.12	0.0000



**Table 2** Shows that, there were highly statistically significant differences in satisfactory level of knowledge scores related to all items regarding care provided to patients with polytrauma with marked improvement post protocol implementation among studied nurses ( $p < 0.000$ ).

**Table (3) Difference Between Nurses' Satisfactory Practice Level Regarding Caring for Patients with Polytrauma (Primary Survey) During the Golden Hour Pre and Post Implementation of Nursing Intervention Protocol (n=30)**

Items	Pre-intervention (30)		Post-intervention (30)		X <sup>2</sup>	P Value
	N	%	N	%		
A- Airway maintenance with cervical spine protection	0	0.0	28	93.3	52.5	0.000
B-Breathing and ventilation	0	0.0	15	50	20.0	0.000
C-Circulation with haemorrhage control	0	0.0	24	80	40.0	0.000
D-Disability/ Neurological assessment	4	13.3	27	90	35.31	0.000
E-Exposure and environmental control (protection from hypothermia)	6	20	18	60	10	0.002
Glasgow coma score (GCS) assessment	6	20	28	93.3	32.85	0.000

**Table 3** Displays that, there were highly statistically significant differences in satisfactory level of nurses practice regarding to all items of primary survey provided to patients with polytrauma during the golden hour with an obvious improvement in practice scores were documented post nursing intervention protocol implementation among studied nurses as compared to their pre protocol ( $p < 0.000$ ).

**Table (4) Percentage Distribution of Nurses' Satisfactory Practice Level Regarding Secondary Assessment for Patients with Polytrauma During the Golden Hour Throughout Nursing Intervention Protocol Implementation (n=30).**

Items	Pre-intervention (30)		Post-intervention (30)		X <sup>2</sup>	P value
	N	%	N	%		
-History taking	11	36.7	19	63.3	4.267	0.039
-Head and face assessment	17	56.7	21	70	1.148	0.284
-Chest assessment	6	20	17	56.7	8.531	0.003
-Abdomen/flanks assessment	8	26.7	20	66.7	9.643	0.002
-Back assessment	14	46.7	21	70	3.360	0.067
-Extremities assessment	14	46.7	26	86.7	10.800	0.001
-External genitalia assessment	4	13.3	16	53.3	10.800	0.001
<b>Total</b>	<b>11</b>	<b>36.7</b>	<b>26</b>	<b>86.7</b>	<b>15.864</b>	<b>0.000</b>

**Table 4** shows that there was statistically significant difference in satisfactory practice level regarding secondary assessment for patients with polytrauma during the golden hour with marked improvement post nursing intervention protocol implementation among studied nurses ( $p < 0.05$ ).

**Table (5) Percentage Distribution of Nurses' Satisfactory Practice Level Regarding Immediate Nursing Interventions for Patients with Polytrauma During the Golden Hour Throughout Nursing Intervention Protocol Implementation (n=30).**

Immediate nursing interventions	Pre		Post		X <sup>2</sup>	P value
	N	%	N	%		
Assist in intubation and mechanical ventilation if ordered	14	46.7	27	90	13.017	0.000
Connect pulse oximetry to measure the oxygen saturation	15	50	26	86.7	9.320	0.002
Administer O2 therapy as needed	17	56.7	28	93.3	10.756	0.001
Suction from the endotracheal tube	13	43.3	24	80	8.531	0.003
Insert vascular access device	16	53.3	21	70	1.763	0.184
Assess vital signs	18	60	28	93.3	9.317	0.002
Follow cardiac monitoring	8	26.7	18	60	6.787	0.009
Administer medication immediately as prescribed	20	66.7	27	90	4.812	0.028
Insert nasogastric tube	12	40	19	63.3	3.270	0.071
Insert Indwelling urinary catheter	9	30	20	66.7	8.076	0.004
Do possible diagnostic tests as ordered	19	63.3	30	100	13.469	0.000
Document the nursing management	5	16.7	25	83.3	26.667	0.000
Total	14	46.7	26	86.7	10.800	0.001

**Table 5** represents that there was statistically significant difference in satisfactory practice level regarding immediate nursing interventions for patients with polytrauma during the golden hour with marked improvement post nursing intervention protocol implementation among studied nurses ( $p < 0.05$ ).

**Table (6) Correlation between Total Knowledge Score and Total Practice Score Regarding Care of Polytrauma Patients During the Golden Hour Throughout Nursing Intervention Protocol Implementation**

Items	Total pre knowledge		Total post knowledge	
	r	P	r	P
Total pre practice	0.775	0.000002	0.467	0.009
Total post practice	0.605	0.000	0.206	0.274 (NS)

$P > 0.05$  NS  $P < 0.001$  HS

**Table 6** reveals that, there was a positive correlation between total practice and total knowledge pre and post implementation of the nursing intervention protocol at  $P < 0.05$ .

**Table (7): Relation between studied nurses' knowledge score pre, post nursing intervention protocol implementation and demographic characteristics.**

Age		Less than 25 years	25 to 40 years	T	P	
		Mean + SD	Mean + SD			
Total knowledge	Pre intervention	24.40 + 6.62	25.85 + 6.41	0.578	0.568	
	Post intervention	43.3 + 2.00	43.2 + 3.56	0.082	0.935	
Gender		Male (14)	Female (16)	T	P	
Total knowledge	Pre intervention	22.28 + 5.19	28.06 + 6.26	2.725	0.011	
	Post intervention	42.71 + 2.33	43.68 + 3.65	0.856	0.399	
Education		Diploma (10)	Nursing Insatiate (14)	Bachelor's degree (6)	F	P
Total knowledge	Pre intervention	24.70 + 6.51	23.28 + 6.09	31.33 + 3.01	4.133	0.027
	Post intervention	42.10 + 4.04	42.86 + 2.21	46.00 + 1.09	3.786	0.036
Training		No (26)	YES (4)	T	P	
		Mean + SD	Mean + SD			
Total knowledge	Pre intervention	24.73 + 6.62	29.50 + 2.08	1.41	0.169	
	Post intervention	42.96 + 3.15	45.00 + 2.16	1.24	0.226	

Table 7 illustrates that, there was a significant relation Between Studied Nurses' Knowledge Score Pre nursing intervention protocol Implementation and gender & education, while there was no significant relation between knowledge and age and previous training.

**Table (8) Relation between Nurses' Practice Score Pre, Post nursing intervention protocol Implementation and General characteristics**

Age		Less than 25 years (10)	25 to 40 years (20)	T	P	
		Mean + SD	Mean + SD			
Total Practice	Pre intervention	44.20 + 23.8	37.90 + 24.22	0.604	0.50	
	Post intervention	77.20 + 16.37	84.95 + 12.20	1.46	0.155	
Gender		Male (14)	Female (16)	T	P	
Total Practice	Pre intervention	31.85 + 25.14	47.12 + 20.41	1.835	0.077	
	Post intervention	76.50 + 16.52	87.5 + 8.91	2.31	0.028	
Education		Diploma (10)	Nursing Institute (14)	Bachelor's degree (6)	F	P
Total Practice	Pre intervention	44.90 + 20.60	34.92 + 24.65	62.33 + 12.89	4.006	0.030
	Post intervention	86.00 + 10.13	75.78 + 15.56	91.67 + 7.94	3.87	0.033
Training		No	Yes	T	P	
		Mean + SD	Mean + SD			
Total Practice	Pre intervention	38.31 + 24.72	51.5 + 11.35	1.038	0.308	
	Post intervention	81.73 + 14.63	86.50 + 8.35	0.630	0.534	

**Table 8** represents that there was a significant relation Between Studied Nurses' practice Score Pre and Post nursing intervention protocol Implementation and gender & education, while there was no significant relation between knowledge and age and previous training.

### Discussion:

Poly-trauma is one of the major causes of death and disability in the world around, knowing how to tackle and dealing with the causes and managing the patients inflicted with poly-trauma can greatly reduce the morbidity and mortality that it carries with it. Because these poly-traumatic injuries are so often life-threatening, initial care of poly-trauma patients in emergency departments essentially aims to stabilize vital functions and prevent premature

death. Thus, the nature and speed of interventions could quite literally mean the difference between life and death (*American College of Surgeons, 2018*).

Nursing and health care professionals must present knowledge, skills, and attitudes essential to promote the maintenance of the life of the public and restore the health conditions of individuals as early as possible. The initial action of a polytraumatized patient

is a determining factor; therefore, nursing activities are fundamental, from a correct assessment, the application of prescribed treatment and specific care to ensure the survival and decrease of sequelae of the trauma patient. Therefore, the aim of this study was to evaluate Impact of Implementing nursing intervention protocol on Performance of Nurses Caring for Patients with Polytrauma during Golden Hour (*Espinoza, 2011*).

Regarding demographic characteristics, the current study demonstrated that, more than half of the nurses were females, this result might be due to that previously most of the nursing schools gradulators were females, this finding is consistent with *Mustafa and Adam (2019)* who found that The highest number of study subjects were females and claimed that May be because most of the nursing schools were for women. While that is incongruent with *Ahmed, Taha and Zaton (2017)* in a study about "Nurses' Knowledge and Practice of Trauma Patients during Golden Hours of Care" found that more than half of study group of nurses were males.

Concerning to the years of experience, the current study results revealed that, mean experience years were  $7.53 \pm 5.26$ , and more than two thirds of nurses had less than ten years of experience in emergency, which indicate that working in emergency department need young personnel because this place needs more energy, fitness and physical wellbeing. This result agrees with *Elfaki, Mustafa and Hassan (2016)*, who found that, about half of the studied nurses had less than ten years of experience. Also, this result agrees with a study done by *Ibrahim (2016)*. According to their years of experience, it was found that, less than two-thirds of them had experience less than five years.

In relation to educational level we found that, nearly half of the studied nurses were graduated from nursing institute and only less than one quarter had bachelor's degree in nursing. This was consistent with *Ali (2019)*, who reported in a study entitled "Assessment of nurses performance regarding care of patients with traumatic head injury during the golden hour" that, more than three fifths of the studied nurses were technical health institute, this might elaborate the current condition of nursing qualification on emergency department. While these findings were not in accordance with *Maarouf, (2012)* in a study about "Nurses' Performance for Patients with Traumatic Head Injury during Golden Hour" Who found that close to half of the emergency nurses had a bachelor's degree. It means that the number of nurses with a bachelor's degree has dropped in number year after year, which might be because the young bachelor's degree nurses are looking for travelling abroad for money and working as head nurse on other departments.

Regarding the nurses previous training course about polytrauma, the current study found that most of nurses did not attended training courses and the minority of them attended training and gained benefits from it. This might reflect the shortage of the emergency nurses, so that not all of them able to attend training programs. This finding was consistent with *Mohamed (2011)*. in a study about nurses' practice and adverse health effects on nurses dealing with chemotherapeutic agents, a study at Zagazig University, who reported that less than one quarter of studied sample had a training course. In the same line *Ali (2019)* stated that more than two thirds of nurses did not receive training course about management of patient with traumatic head injury during the golden hour. While, this finding was inconsistent with *Ahmed et al., (2017)*,

who revealed that nearly three-quarters of the studied sample had training courses on trauma patients, and more than four-fifths benefited from it.

Regarding to nurses knowledge pre and post implementation of nursing intervention protocol this study results shows that, there were highly statistically significant differences in satisfactory knowledge level related to all items of knowledge (General knowledge about trauma and its causes, Airway, Breathing, Circulation, Disability: Neurological assessment, Exposure & environment assessment and nursing intervention) regarding care provided to patients with polytrauma during the golden hour with marked improvement post protocol implementation among studied nurses. This result indicated an improvement in various areas of knowledge which might be attributed to the theoretical knowledge included in the nursing intervention protocol provided to the studied nurses. These results were consistent with *Shehab, Ibrahim, and Abd-Elkader (2018)*, who stated that there were high statistically significant differences in the scores of knowledge related to all initial care items provided to traumatic brain injury patients, before, after, and three months after program intervention. This result goes in the same line *El-Gilany, Hatata, Soliman, and Refaat, (2013) and Cook, et al., (2013)*, who stated that, studied nurses' satisfactory knowledge was increased after completing the educational program implementation.

In relation to percentage distribution of nurses' satisfactory practice regarding caring for patients with polytrauma during the golden hour pre and post implementation of nursing intervention protocol, the current study results shows a significant difference between studied nurses' satisfactory practice level regarding caring for

patients with polytrauma: primary survey, secondary assessment (history taking & head to-toe assessment) and immediate nursing interventions during the golden hour pre/post-implementation of the nursing intervention protocol. These results indicated an improvement in various areas of practice. This improvement might be related to the received practical training about care of patients with polytrauma during the golden hour in the intervention protocol. This was consistent with *Ebrahimi, Ghanbarzahi, Gorgich, Darban, and Shirzadi, (2016)* who found that, comparing the performance of emergency nursing personnel before and after training Emergency Severity Index shows that, their performance in accurate identification of patient triage levels increased from about one third of the study group prior to intervention to more than three quarters of them after intervention. In the same line *Seliman, Morsy, Sultan, Elshamy, and Ahmed, (2014)* found a highly statistically significant difference in total and subtotal of practice among pre- protocol, immediately post, and two months following the protocol implementation which indicates a positive impact of the protocol to improve nurses' practices.

Regarding relation between studied nurses' knowledge score pre, post implementation of the nursing intervention protocol and demographic characteristics. Our study illustrates that there was a highly significant relation between studied nurses' knowledge score and gender pre implementation of the nursing intervention protocol but non-significant post implementation (P-value= 0.004 & 0.151) respectively. This may explain that after implementation of implementation of the nursing intervention protocol both males and females nurses acquire and improve their level of knowledge regarding care of the

polytrauma patients during the golden hour so the significance difference before became non significance after implementation of the nursing intervention protocol. This agreed with *Ali (2019)*, who reported that the relationship between performance of nurses (knowledge & practice) and gender was highly statistically significant. This is disagreeing with *Ahmed et al., (2017)*, who found that there was no statistically significance difference between nurses' knowledge and gender.

Also in relation to educational level, in the current study there was a highly significant relation with total knowledge mean score pre and post implementation of the nursing intervention protocol (P value= 0.004 & 0.023) respectively with improvement post implementation as compared to pre-implementation. These results might be due to the majority of the sample nearly half of the studies nurses and one third respectively were graduated from nursing institute and diploma and most of them had lack of in-service training program about how to deal with polytrauma patients during the golden hour, so that they benefited from the nursing intervention protocol and gain knowledge and practice. These results were inconsistent with *Seliman, et al., (2014)*, who stated that, there was no statistically significant relation between nurses' knowledge and nurses' educational level.

In relation to age and training courses and its relation to changes in mean knowledge score from pre to post intervention, the current study revealed that, there is no significant relation with total knowledge mean score pre and post implementation of the nursing intervention protocol. This was incongruent with *AL-gabri, Mohammed, and Mehany, (2019)* who found that there were statistical significant difference

between age and nurses' knowledge while consistent with his other result related to correlation of nurses knowledge and other variables as (training courses attendance, marital status, qualifications and gender) as it was found that there was no relationship between the total score of nurses' knowledge and the other General characteristics variables .

Regarding relation between nurses' practice score pre, post nursing intervention protocol implementation and demographic characteristics. This study findings revealed that, there was a significant relation between studied nurses' practice score pre and post nursing educational guidelines implementation and gender & level of education. This could be due to lack of continuous in-service training, lack of orientation for newly employed nurses regarding care of patients with polytrauma during the golden hour. This result was inconsistent with *Ahmed, (2017)* who revealed that, there was no statistically significant relation between the performance of nurses and their educational level.

According to correlation between total knowledge score and total practice score regarding care of polytrauma patients during the golden hour throughout nursing intervention protocol implementation. The current study showed that there was a highly statistically significant correlation between total practice and total knowledge pre and post implementation of the nursing protocol. This agree with *Shehab, et al., (2018)*, who reported that there is a positive correlation between nurses' knowledge and practice. Also in the same line with *Shahin, Mohamed, and Sayed, (2012) and Seliman, (2014)*, who stated that a highly statistical significant correlation between participants' scores of knowledge and practice in preprogram, post-program,

following the instructional program. *Biz, Buffon, Marin and Petrova (2016)* highlighted the need of a nursing assessment guideline for multiple trauma patients admitted to the trauma ward.

### **Conclusion:**

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There was an improvement in knowledge and practice post nursing intervention protocol implementation among studied nurses with statistically significant differences between pre- and post- knowledge, and practice post implementation. Also, there was a positive correlation between total practice and total knowledge pre and post nursing intervention protocol implementation.

### **Recommendations**

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**Based on the results of the current study, the following are suggested:**

1. Close supervision and teaching during work are needed to ensure quality of care for patients with polytrauma during the golden hour.

2. Developing continuous educational programs, including evidence based practice based on needs assessment for nurses to improve their performance and quality of care regarding care of patients with polytrauma during the golden hour.

3. Developing an educational handout about nursing management for patients with polytrauma during the golden hour must be provided to nurses as a guide during their practice.

4. Improve and update nurses' knowledge and skills about management of patients with polytrauma during the golden hour through providing conferences and workshops.

5. Developing system for periodical nurses' evaluation to determine strategies for updating their knowledge and enhancing their practice.

6. Replication of the study on a large probability sample and different geographical areas to generalize the results.

7. More research is needed to evaluate the effectiveness of early intervention on functional health status in patients with polytrauma during the golden hour.

### **Conflicts of interest disclosure**

The authors declare they have no conflicts of interests.

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