

## Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury

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### Abstract:

**Background:** Head injury is a growing international public health problem among children. Pediatric triage is the keystone of organization of care in emergency centers. **Aim of this study:** Was to evaluate the effect of pediatric triage educational program on nurses' performance regarding head injury. **Design:** A quasi-experimental design was utilized to conduct this study. **Setting:** The study was conducted at Trauma Room and Pediatric Room of the General Emergency Department in Benha University Hospital. **Sample:** A convenient sample of 68 nurses and a purposive sample of 68 children with head injury were included and selected from the previously mentioned setting. **Tools of data collection:** Three tools were used, (I): A structured interviewing questionnaire to assess nurses' knowledge related to pediatric triage and head injury. (II): Child medical assessment sheet to assess current medical condition and child's level of consciousness. (III): observational checklists to assess nurses' actual practice related to pediatric triage. **Results:** Majority of studied nurses had unsatisfactory level of knowledge in the pre- program phase. While most of them had satisfactory level of knowledge in the post- program implementation. All the studied nurses had incompetent level of actual practices related to pediatric triage in the pre- program phase. While most of them had competent level of actual practices in the post- program phase regarding pediatric triage. **Conclusion:** The educational program was effective method for improving the nurses' knowledge and actual practices regarding pediatric triage. **Recommendation:** Comprehensive educational programs related to pediatric triage are required to enhance nurses' performance.

**Keywords:** Educational program, Head injury, Nurses' performance, Pediatric triage.

### Introduction:

Head injury is a serious medical condition and one of the most leading causes of pediatric morbidity and mortality worldwide. It occurs when a sudden trauma causes damage to the scalp, skull, or brain leading to a disruption in the normal function of the brain. Head injuries among children are responsible for a significant proportion of acquired disability, communication and language difficulties, attention disorder and learning difficulties (Ignatavicius et al., 2018).

There are many reasons that cause head injury among children which include motor

vehicle accidents (automobiles, motorcycles, or struck as a pedestrian), from violence, from falls, or as a result of child abuse. Subdural hematomas and brain hemorrhages (called intraparenchymal hemorrhages) can sometimes happen spontaneously. While more than 95% of serious head injuries are related to child abuse (Wilkinson et al., 2016).

Some types of head injury can cause temporary or short-term problems with normal brain function, including problems with how the child thinks, understands, moves, communicates, and acts. More serious head injuries can lead to severe and permanent disability, and even death. So some injuries are

considered primary, meaning the damage is immediate. Other outcomes of head injury can be secondary, meaning they can occur gradually over the course of hours, days, or appear weeks later. These secondary brain injuries are the result of reactive processes that occur after the initial head trauma (**American College of Surgeons Committee on Trauma, 2018**).

The initial management of head injury includes proper history taking, cardiopulmonary stabilization, general examination, emergency measures for associated injuries (as tracheotomy, chest tube, neck stabilization and abdominal paracentesis), proper neurological examination, therapeutic agents and investigation. While emergency nurses have a major effective role for children with head injuries as assessment, observation, setting priorities for nursing intervention, emotional support and rehabilitation role (**Rachel et al., 2019**).

Pediatric triage is the keystone of organization of care in emergency centers and it is a term used to describe the sorting of children for treatment priority in Emergency Centre. Pediatric triage aims at promoting the safety of children by ensuring that timing of care and resource allocation is requisite to the degree of illness or injury. Pediatric triage is a complex process involving decision-making by emergency nurse under uncertainty in an environment laden with emotion, driven by urgency and constrained by negotiation. Therefore the emergency nurse's ability to make accurate clinical judgments about children urgency and their need for intervention are essential to the delivery of safe and effective emergency care (**Adienh et al., 2018**).

Pediatric triage process includes gathering relevant children information, performing a focused assessment, determining an acuity level, and prioritizing the needs of the children seeking emergency care. Accuracy in problem identification is a crucial component of clinical decision making, especially in the triage encounter, and requires the nurse to establish boundaries of physiological and psychological stability as well as predict the potential trajectory of the children's condition (**Alazmi & Mohey, 2017**).

The role of emergency nurse regarding pediatric triage is not to reach a diagnosis, but to focus on observing and quickly collecting as much relevant data as necessary to assign a category based on this data and determine the children's urgency. After the initial assessment; Children requiring immediate care are identified while children who can safely wait longer or who can be seen by another caregiver such as the general practitioner or nurse practitioner are recognized (**Aeimchanbanjong & Pandee, 2017**).

### **Significance of the study**

Head injury is a growing international public health problem among children. Head injury is leading to morbidity and mortality globally. The genuine scope of the problem is unknown. Worldwide, more than 400.000 children between infancy and 14 years of age are assessed in the emergency departments for assessment and treatment of head injury. (**National Center for Injury Prevention and Control, 2018**).

The pediatric triage is the first mission implemented by the emergency nurse to the children when arrival to emergency department for quick and accurate medical care .As pediatric triage is considered to be a complex process which depend on accurate

## Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury

assessment and good critical thinking, the need for high qualified and well trained nurse working with children in general emergency department is essential for safe and effective emergency care (Urden et al., 2020).

### **Aim of the study**

This study aimed to evaluate the effect of pediatric triage educational program on nurses' performance regarding head injury.

### **Research hypotheses**

The educational program would have a positive effect on nurses' performance regarding pediatric triage of children with head injury.

### **Subjects and Method**

#### **Research Design:**

A quasi-experimental design was utilized to conduct this study

#### **Research Setting:**

The study was conducted at Trauma Room and Pediatric Room in the General Emergency Department at Benha University Hospital in Benha city. The general emergency department at Benha University Hospital located in the surgery building in the first floor, consists of six rooms; the trauma rooms contains 12 beds and the pediatric room contains 6 beds.

#### **Research Subjects:**

1- A convenient sample of 68 nurses who are working as a full- time nursing provider at the previously mentioned setting regardless their personal characteristics and willing to participate in the study, where 43 nurses working in the trauma room and 25 nurses working in the pediatric room.

2- A purposive sample of 68 children with head injury was chosen from the previously

mentioned setting after fulfilling the following:

#### **Inclusion criteria:**

- All children diagnosed with different degrees and types of head injury and their age range from 3 to 10 years old.
- Conscious and able to communicate.

#### **Exclusion criteria:**

- Children with history of mental disability or epilepsy.
- Children with multi- traumatic injuries.

#### **Tools of Data Collection:**

Data was gathered by using the following three tools:

#### **A Structured Interviewing Questionnaire format (pre & post):**

It was designed by the researcher based on a review of the current relevant researches and literatures. It was written in a simple Arabic language and used twice before and after implementation of the educational program, consists of three parts:

**Part (a): Characteristics of the studied nurses such as** age, gender, qualifications, years of experience in emergency department, attending training courses about pediatric triage of children with head injuries.

**Part (b):** this part concerned with assessment of nurses' knowledge regarding pediatric triage and consists of (23) question divided as the following: (3) multiple choice questions covering overview about pediatric triage, One question related to types of pediatric triage, (12) multiple choice questions covering levels of acuity related to Emergency severity index Version 4 triage system, (2) multiple choice questions related to steps of pediatric triage process, one multiple choice question related to quick assessment, one multiple choice question related to primary assessment, (2) multiple choice questions

covering immediate life -saving interventions, one multiple choice question covering role of triage nurse in pediatric assessment process.

**Part (c):** This part concerned with assessment of nurses' knowledge regarding pediatric head injuries and consists of (21) multiple choice questions and included the following; (3) multiple choice questions covering nurses' knowledge regarding pediatric head injury, (4) multiple choice questions covering nurses' knowledge regarding types of pediatric head injury, (4) multiple choice questions related to nurses' knowledge about clinical manifestations, (6) multiple choice questions related to Glasgow Coma Scale, one question about complications, one question about health education for mothers, one question about prevention and one question about role of emergency nurse in immediate nursing interventions.

**Scoring system:**

Studied nurses' answers were compared with model key answer; where scored as correct answer had score (1), incorrect answer or don't know had scored (0). Total knowledge scores ranged from (0- 44) points. In this respect the level of nurses' knowledge was categorized as the following: unsatisfactory level of knowledge (< 80%) was ranged from 0 to less than 35 score, satisfactory level of knowledge ( $\geq$  80%) was ranged from 35 to 44 score.

**Child medical assessment sheet:** To assess children's current medical condition with head injury and their level of consciousness while admitting at emergency department. It consists of three parts:

**Part (a): Characteristics of the studied children** such as age, gender, and birth order.

**Part (b): Current medical data of the studied children:** contained: main complaint,

place of injury, vital signs, primary assessment of the injured child, disability, and occurrence of any complications.

**Part (c): Glasgow Coma Scale (GCS):**

It was adopted from **Dominic et al., (2016)**. It was used to assess the child's level of consciousness and documenting the neurologic status of head injured children by the researcher once before implementation of the educational program. It was obtained by the observation of spontaneous activities of the studied children and use of verbal or painful stimulus. It composed of three subscales divided as following: Eye opening (4 items), Best motor response (6 items), and verbal response (5 items).

**Scoring system for Glasgow Coma Scale:**

Scores can be given to each item as the following: eye opening with criterion; spontaneous response (4 points), response to voice (3 points), response to pain (2 points) and no response (0 points). While best motor response with criterion; follow commands for movement (6 points), localizes pain (5 points), withdraws to pain (4 points), abnormal flexure posturing (3 points), abnormal extension posturing (2 points) and no response (1 point). Regarding verbal response with criterion; oriented (5 points), confused conversation (4points), inappropriate words (3points), incomprehensible sounds (2 points) and no response (1 point). Total score range from 3 to 15.

**Accordingly, assessment of degrees of head injuries can be divided as following:**

- Mild head injuries when total score from 13-15.
- Moderate head injuries when total score from 9-12.
- Severe head injuries when total score < 8.

## Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury

### **Observational checklists format (pre & post):**

It was adopted from **Timothy et al., (2013) and Olgers et al., (2017)** to assess the nurses' actual practices regarding pediatric triage process. It was used twice before and immediately after the implementation of the educational program. It contained 38 steps grouped under two procedures:

#### **1- First procedure: Quick assessment to head injured children: (13 steps)**

It depended on a quick look at children with head injury without classifying them into any levels of acuity to provide immediate life-saving interventions. It contained three physiological predictors that included: appearance (5 steps), work of breathing (5 steps), and circulation to skin (3 steps).

#### **2- Second procedure: Primary assessment to head injured children: (25 steps)**

It based on a standard "ABC" plus "D" and "E" concept to identify level of acuity and categorize injured children according to level of acuity. It included five physiological predictors that contained: airway assessment (5 steps), breathing assessment (5 steps), circulation assessment (9 steps), disability assessment (4 steps), and exposure assessment (2 steps).

**The scoring system** consisted of two points: done correct was scored (1), not done was scored (0). The total scores were ranged from (0 to 38) points. Accordingly, the level of nurses' actual practices was categorized as the following; 80% and more were considered competent practice where total scores were ranged from 30 - 38 score. While incompetent practices (less than 80%) was ranged from 0 to less than 30 score.

### **Validity:**

Tools of data collection were investigated for their content validity by a panel of three

experts in Pediatric Nursing specialty from Faculty of Nursing, Benha University, to test content validity of the tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinions were elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration and the tools were regarded as a valid from the experts' point of view.

### **Reliability:**

Reliability for tools was applied by the researcher for testing the internal consistency of the tools by administrating of the same tool to the same subjects under similar condition. Internal consistency reliability of all items of the tools was assessed using Cronbach's alpha coefficient. It was 0.82 for questionnaire sheet, and (0.89) for observational checklist sheet. This indicates a high degree of reliability for the study tools.

### **Ethical consideration:**

A brief explanation of study was given to assure the nurse that information obtained used only the purpose of the study and maintained confidentiality, privacy and take oral consent for participation and all of them have the right to withdraw from the study at any time.

### **Pilot study:**

A Pilot study was conducted to test the clearness and applicability of the study tools and to estimate the time needed for each tool. It was done on the first of October, 2020 and conducted on 10% of the total subjects, (7) nurses working in emergency department at Benha University Hospital who excluded from the present study to avoid sample bias. In the light of the pilot study analysis, modifications were done and last form was developed.

### **Field work:**

Field work was carried out to achieve the aim of the current study through following phases; assessment, planning, implementation and evaluation phases. These phases were conveyed from the earliest starting point of November, 2020 to the end of July, 2021 covering 9 months. Official permission was obtained from the Dean of the Faculty of Nursing at Benha University and the directors of Benha University hospital to collect the data.

Assessment phase involved interviewing with nurses, children and their parents involving in the study to collect baseline data. The researcher visited Benha University Hospital in Benha city three days / week by rotation from 10 a.m. and extended to 2 p.m. in the morning shift and from 3 p.m. to 6 pm in the evening shift. At the beginning of interview; the researcher welcomed nurses, explained the purpose, duration, activity of the study and take their oral approval to participate in the study prior to data collection. Then, the researcher gave the studied nurses a structured interviewing questionnaire format for filling it to assess the nurses' knowledge regarding pediatric triage and pediatric head injury. It took nearly 30 minutes. Then the researcher observed the nurses' actual practices by using the observational checklists format to assess the nurses' actual practice three times per shift and took mean score of them. It took nearly 30 minutes. After that, the child medical assessment sheet was collected by the researcher from medical hospital records and it took nearly 15 minutes. This period of pretest took 6 weeks.

Planning phase concerned with baseline data obtained from assessment phase and relevant review of literatures, the educational program and the Arabic booklet were designed by the researcher according to the studied

nurses' needs. It was constructed, revised and modified from the related literature to improve the nurses' knowledge, and actual practices regarding pediatric triage and pediatric head injury. Different methods of teaching were used as modified lectures, group discussions, brain storming and demonstration and re-demonstration.

### **Statement of objectives**

#### **General objective:**

The aim of the program was to improve studied nurses' knowledge and their actual practices regarding pediatric triage for children with head injury.

The implementation phase was achieved through sessions, each session started by a summary of the previous session and objectives of the new one. Taking into consideration the use of Arabic language that suits all nurses' educational level. Motivation and reinforcement during sessions were used to enhance motivation for the sharing in the study. The studied nurses' were divided into 17 groups; each group consisted of 4 nurses. The program has taken 9 hours for each group; 4 hours for theoretical part and 5 hours for practical part. The total numbers of sessions were 9 sessions distributed as the following; (4) sessions for theoretical part, each session kept going for 60 minutes and (5) sessions for practical part, each session kept going for 60 minutes which were repeated to each group. After the implementation of the educational program, the post- test was carried out immediately to assess nurses' knowledge and actual practices by using the same formats of pre-test to evaluate the effect of implementation of pediatric triage educational program on nurses' performance.

### **Statistical analysis**

The collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 20.

## Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury

It was analyzed by Chi-square test for categorical variables to compare between different groups. Monte Carlo correction test Correction for chi-square when more than 20% of the cells have expected count less than 5. Pearson coefficient test to correlate between two normally distributed quantitative variables. Wilcoxon signed ranks test for abnormally distributed quantitative variables, to compare between two periods. Data were presented in the form of tables and graphs. A significant level value was considered when ( $p < 0.05$ ) and a highly significant level value was considered when ( $p < 0.001$ ). No statistical significance difference was considered when ( $p > 0.5$ ).

### **Results:**

**Table (1):** Shows that more than half (58.8 %) of the studied nurses' age were from 25 to less than 30 years, where (Mean  $\pm$  SD was  $26.73 \pm 4.20$ ) and more than three quarters (85.3%) of them were female. Regarding nurses' qualifications, more than half (44.1 %) of them graduated from technical institute of nursing. As regard years of experiences, One third (32.4 %) of the studied nurses had experience from one year to less than five years and also more than one third (33.8%) of them had experience from five years to less than ten years with (mean  $\pm$  SD was  $4.65 \pm 4.28$ ). Moreover, all of them (100%) had not received any previous training courses related to pediatric triage.

**Table (2):** Clarifies that (44.1%) of the studied children were in the age group 3 -< 5 years with (Mean  $\pm$  SD  $5.45 \pm 2.30$ ). while more than half (58.8%) of them were males. As regards birth order, more than third (36.8%) of the studied children were the fourth child or more in the family.

**Figure (1):** Related to pediatric triage in the post- program phase compared to (0.0%) of them in the pre-program phase. While

(94.1%) of the studied nurses' had satisfactory knowledge level related to pediatric head injury in the post- program phase compared with (1.5%) of them in the pre- program phase.

**Figure (2):** Reveals that there was an improvement in the overall nurses' knowledge level post-implementation of the educational program about the pediatric triage and pediatric head injury, where (86.8%) of them had satisfactory knowledge level in post program phase compared to (1.5%) of them in pre- program phase.

**Figure (3):** Shows different degrees of head injury severity for injured children after using Glasgow coma scale by the researcher, where (85.3%) of them had mild head injury, (11.8%) of them had moderate head injury, and (2.9%) had severe head injury.

**Figure (4):** Shows that (80.9 %) of the studied nurses' had competent actual practice level related to quick assessment in the pediatric triage process in the post- program phase compared to (0.0%) of them in the pre-program phase. While (64.7%) of the studied nurses' had competent actual practice level in the post- program phase compared with (0.0%) of them related to primary assessment in the pediatric triage process in the pre- program phase.

**Figure (5):** Reveals that there was an improvement in the overall nurses' actual practice level post-implementation of the educational program about the pediatric triage and pediatric head injury, where (80.9%) of them had competent actual practice level in post program phase compared to (0.0%) of them in pre- program phase.

**Table (3):** Shows that there was a highly statistical significant positive correlation between nurses' overall level of knowledge and their overall level of actual practices scores in post program phase ( $r = 0.818^*$ ,  $p < 0.001^*$ ).

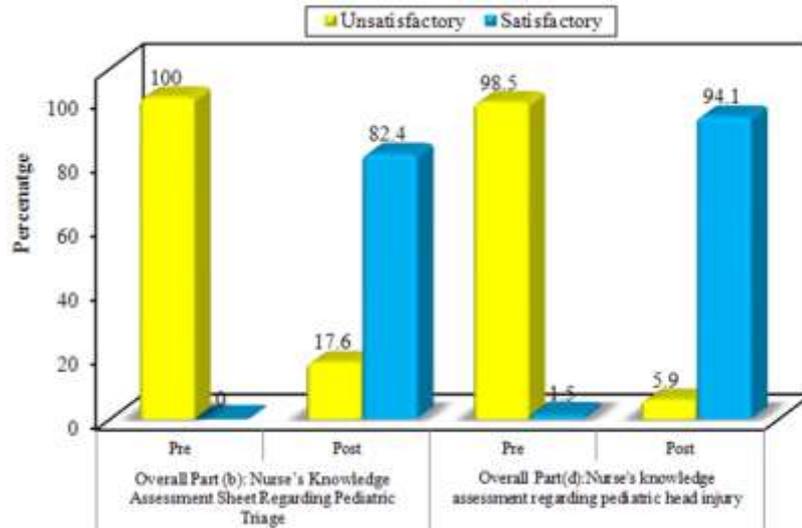
**Table (1): Percentage distribution of the studied nurses according to their characteristics (n = 68)**

<b>Characteristics</b>	<b>No.</b>	<b>%</b>
<b>Age</b>		
20 –< 25 years	20	29.4
25 –< 30 years	<b>40</b>	<b>58.8</b>
≥30 years	8	11.8
Mean ± SD.	<b>26.73 ± 4.20</b>	
<b>Gender</b>		
Male	10	14.7
Female	<b>58</b>	<b>85.3</b>
<b>Qualifications</b>		
Bachelor of nursing	20	29.4
Technical institute of nursing- Diploma (secondary school)	<b>30</b>	<b>44.1</b>
Master degree in nursing	15	22.1
	3	4.4
<b>Years of experience in emergency department</b>		
< 1 year	15	22.1
1 year –< 5 years	<b>22</b>	<b>32.4</b>
5 years –< 10 years	<b>23</b>	<b>33.8</b>
≥10 years	8	11.7
Mean ± SD	<b>4.65 ± 4.28</b>	
<b>Attending training courses related to pediatric triage</b>		
Yes	0	0.0
No	<b>68</b>	<b>100.0</b>

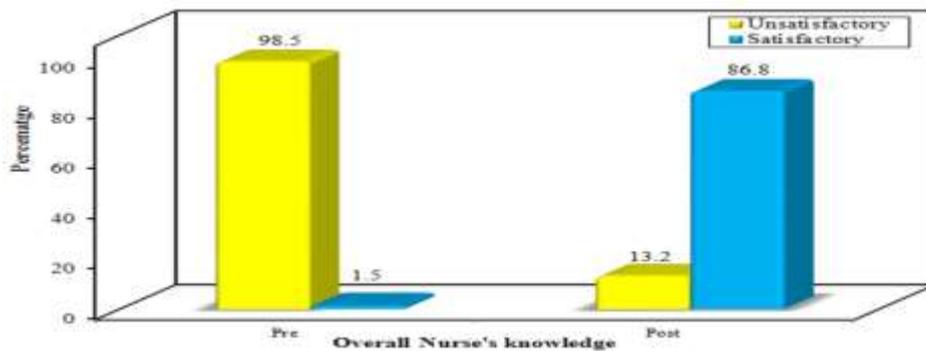
**Table (2): Percentage distribution of the studied children according to their characteristics (n = 68)**

<b>characteristics</b>	<b>No.</b>	<b>%</b>
<b>Age</b>		
3–<5 years	30	<b>44.1</b>
5–<7 years	20	29.4
7–10 years	18	26.5
Mean ±SD.	<b>5.45 ± 2.30</b>	
<b>Gender</b>		
Male	40	<b>58.8</b>
Female	28	41.2
<b>Birth order</b>		
First child	10	14.7
Second child	13	19.1
Third child	20	29.4
Fourth or fifth	25	<b>36.8</b>

**Pediatric Triage Educational Program for Improving Nurses' Performance regarding  
Head Injury**



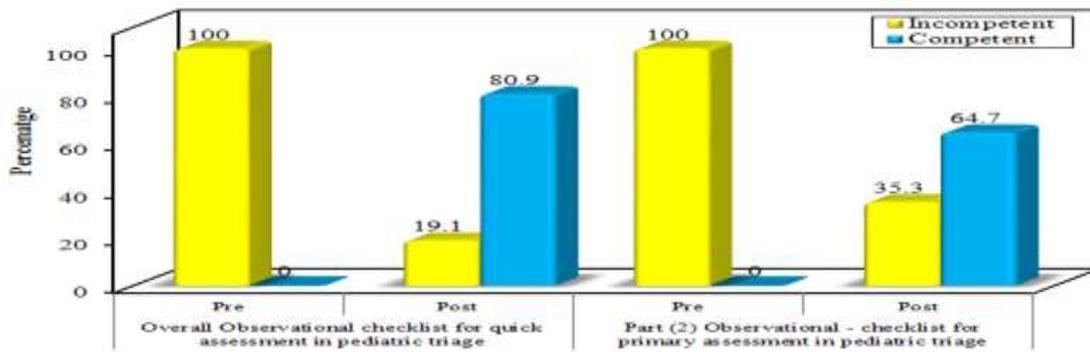
**Figure (1):** Percentage distribution of the studied nurses' regarding knowledge level about pediatric triage and head injury throughout the program phases (n = 68)



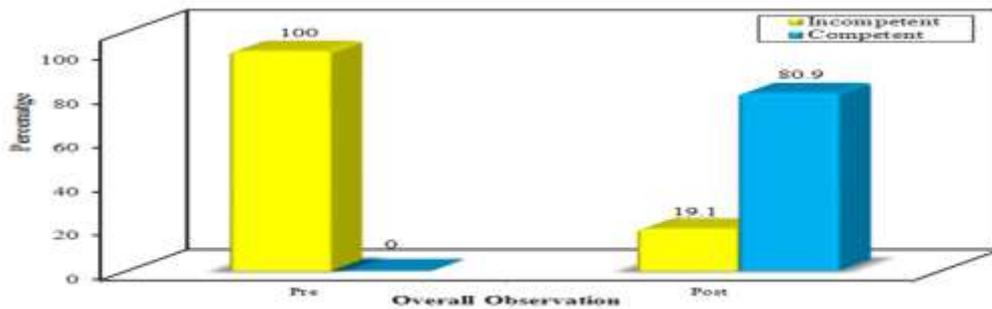
**Figure (2):** Percentage distribution of the studied nurses' regarding overall knowledge level about pediatric triage and head injury throughout the program phases (n = 68)



**Figure (3):** Percentage distribution of the studied children's total score regarding severity of head injury after Glasgow coma scale assessment (n = 68)



**Figure (4): Percentage distribution of the studied nurses' regarding actual practices level related to quick assessment and primary assessment in the pediatric triage process throughout the program phases (n = 68)**



**Figure (5): Percentage distribution of the studied nurses' overall actual practices regarding pediatric triage process throughout the program phases (n = 68)**

**Table (3): Correlation between nurses' overall level of knowledge and their overall level of actual practices regarding pediatric triage (n = 68)**

Overall actual practice	Overall Knowledge	
	r	P
Pre	0.495*	<0.001*
Post	0.818*	<0.001*

**r: Pearson coefficient\*:** highly statistically significant at  $p \leq 0.001^*$

## Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury

### Discussion

Pediatric triage is the first step of the pediatric assessment at the emergency department, occurs in a highly dynamic environment that functions under constraints of time, physical space, and children needs that may exceed available resources. Through pediatric triage, children are placed into one of a limited number of categories using a subset of diagnostic information. To facilitate this task and standardize the triage decision process, pediatric triage educational program have been implemented. However, these protocols are interpreted differently by highly experienced nurses (**Sahier et al., 2018**).

Pediatric head injury, which is a dominant cause of pediatric hospital visits, frequently requires extensive treatment and often results in disability or death. Mortality and morbidity rates among children with head injuries remain significant, despite progress in prevention, diagnosis, and treatment. The major causes of pediatric head injury are falls, recreational activities, and motor vehicle crashes. Prolonged intensive care and rehabilitation are often necessary, even in the face of uncertain outcome (**Jihad et al., 2018**).

As regards to nurses' personal characteristics, findings of the present study revealed that more than half of the studied nurses' their age were range from 25 to less than 30 years. From the researcher point of view, the emergency department needs hard work and urgent performance from staff nurses. This finding was in the same context with **Hany et al., (2019)**, who conducted a study of "Nursing Personnel Perception and Readiness toward Role of Triage Nurse in Emergency Department" and found that, more than half of staff nurses' ages were between 25 to 30 years old.

Regarding qualifications of the studied nurses, the present study revealed that, one third of the studied nurses had technical nursing education. This result may be due to the fact that technical institute in nursing provide large number of nurses. This finding was in agreement with **Farzad et al., (2018)** who carried out a study to "Evaluate the Accuracy of Emergency Nurses in Correct Triage Using Emergency Severity Index Triage in Sina Hospital of Tabriz" and found that, one third of the studied nurses had technical nursing education.

Concerning years of experiences, The present study conducted that one third of the studied nurses had experience in the emergency department from 1 to 5 years and the other one third from 5 to 10 years. This may be due to working in the emergency department need accurate and precision work that can be acquired from experience. This result was in agree with **Orapan et al., (2018)**, who conducted a study to "Identify Factors Influencing the Accuracy of Triage by Registered Nurses in Trauma Patient".

Nonetheless, all the studied nurses reported that, they had no previous training courses regarding pediatric triage. This explained their unsatisfactory knowledge level and incompetent actual practice level at the pre-program phase. This finding was supported with **Faridi et al., (2019)**, who conducted a study to assess "The Effect of Machine Learning – Based Prediction of Clinical Outcomes for Children During Emergency Department Triage" and found that all the staff nurses didn't receive any previous training courses related to pediatric triage.

On the contrary with, **Karim et al., (2019)** who conducted a study to assess "Trauma Triage Protocol Accuracy at Emergency Department: Improving Nurses' Competency and Self- Efficacy" and showed that, one third

of the staff nurses have participated in courses related to pediatric triage.

After assessing studied nurses' overall knowledge related to pediatric triage at the pre- program phase, the present study showed all the studied nurses' had unsatisfactory knowledge level. This could be due to lack of nurses' desire to enhance their knowledge whether newly or old graduate or lack of training courses for nurses related to pediatric triage in hospitals, as well as the work overload. This finding was congruent with **Sameh et al., (2019)** who carried out a study to assess "The Effect of Triage Education on Nurses' Performance in Diverse Emergency Departments" and found that all the studied nurses had unsatisfactory level of knowledge regarding pediatric triage before implementation of the educational program.

However, after implementation of the educational program, the current study found that more than three quarters of the studied nurses' had satisfactory level of knowledge regarding pediatric triage in the post program phase. This improvement indicated that, the educational program was a successful method to increase nurses' knowledge regarding pediatric triage. This finding was in agreement with **Farrag et al., (2019)** who conducted a study to assess "Education and Training Issues Related to Pediatric Nursing Triage in Mass Gathering, and revealed that the majority of studied nurses had satisfactory level of knowledge at the post program phase.

The present study findings indicated that more than three quarters of the studied nurses had satisfactory knowledge level related to pediatric triage after implementation of the educational program. This could be due to the good effect of the educational program on nurses' knowledge regarding pediatric triage. These findings were in an accordance with **Rostambour et al., (2016)** who conducted a

study about "The Effect of Triage Education by Pre Advance-Organizer Model on the Knowledge Staff Disaster Team Nurses", and revealed that three quarters of the studied nurses had satisfactory overall knowledge level about pediatric triage after implementation of educational program.

As regards to the studied children's characteristics, findings of the present study revealed that almost two third of the studied children's age were from 3 to less than 5 years and more than half of them were males. This result may be because children in this age can be less careful, high risk for injury with absent of parents' observation and males are nuttier than females. This result was agreed with **Larsson, (2019)** who conducted a study to assess "Pediatric Head Injury in The Primary Care Setting" and found that two third of the head injured children ages were from 3 to 5 years old and more than half of them were males.

Regarding degree of head injury severity after using Glasgow coma scale by the researcher, it was found that most of head injured children suffered from mild head injury, while few children suffered from severe head injury. This result may be due to the most common cause of head injury is falls from a bike or stairs which considered mild head injury. **Joseph et al., (2019)** support these findings in a study about "Pre hospital Versus Trauma Center Glasgow Coma Scale in Pediatric Traumatic Brain Injury Children. The study reported that the majority of head injured children suffered from mild head injury.

Concerning the nurses' actual practices before implementation of the educational program regarding pediatric triage, this study illustrated that all the studied nurses had incompetent actual practices level regarding pediatric triage process in pre- program. This result as all the studied nurses had not received

## **Pediatric Triage Educational Program for Improving Nurses' Performance regarding Head Injury**

any previous training courses related to pediatric triage and also lack of continuous training and education performed. This result was agreed with **Simko et al., 2019** in a study entitled "Pediatric Triage Education for The General Emergency Nurse: A Randomized Crossover Trial Comparing Simulation With a Paper Case Study", and found that all the studied nurses had incompetent actual practices level regarding pediatric triage process in pre- program.

The current study highlighted on the nurses' actual practices after implementation of the educational program regarding pediatric triage, and found that more than three quarters of the studied nurses had competent actual practices level at post program phase. This indicated that the current educational program was an effective way for improving the nurses' performance and also the nurses staff were cooperated with the researcher. These findings were similar to **Ebrahimi et al., (2016)**, who

### **Conclusions**

The educational program was an effective method for improving the nurses' knowledge and actual practices regarding pediatric triage. There was a highly statistical significant positive correlation between overall nurses' knowledge scores and their overall actual practice scores after implementation of the educational program.

### **Recommendations**

1- Comprehensive educational programs related to pediatric triage are required to enhance nurses' performance.

2- Training courses related to pediatric triage for newly employed nurses and a refresher courses for existing staff are recommended.

3- A simplified, comprehensive and clarified Arabic guidelines about Pediatric triage must be available in all emergency departments for health care providers.

conducted a study to evaluate "The Effect of Triage Training On The Performance Of Triage Nurses And Emergency Medical Staff of Iran shahr", and found that there were a highly improvement in the nurses' actual practices level after implementation of triage training.

Regarding to correlation between nurses' total knowledge and their total actual practice, this study clarifies that there was a statistical significant a positive correlation between nurses' total knowledge and total actual practice scores throughout the program phases. This result supported by **Sameh et al., 2019** who conduct a study of "educational affect about triage against nurses' ability in implementing triage in emergency room in Palembang hospital" and found that there was a statistical significant a positive correlation between nurses' total knowledge and total actual practice scores throughout the program phases.

4- Applying periodical orientation programs for emergency nurses regarding pediatric triage.

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## برنامج تعليمي حول كيفية فرز الأطفال ذو اصابه بالراس على أداء الممرضين

مها جلال عبدالحليم- آمال غريب سباق - خديجة محمد سعيد

تُعد إصابة الرأس سببًا رئيسيًا لوفاة الأطفال الأكبر من عام واحد في الولايات المتحدة. يتم استخدام عملية فرز الأطفال لتقييم شدة الاصابة وإعطاء الأولوية إلى التدخل الحرج في الوقت المناسب داخل أقسام الطوارئ. لذلك هدفت الدراسة إلي تقييم تأثير برنامج تعليمي حول كيفية فرز الأطفال ذو اصابه بالراس على أداء الممرضين.وقد أجريت هذه الدراسة غرفة الإصابات و غرفه الأطفال التابعه لقسم الطوارئ العامة بمستشفى بنها الجامعي، حيث اشتملت عينة البحث على:عينة متاحه من ٦٨ ممرضه تعمل بقسم الطوارئ في المنشاه المذكوره سابقا بغض النظر عن خصائصهم الشخصية . حيث تعمل ٤٣ ممرضه بغرفة الحوادث و ٢٥ ممرضه بغرفة الأطفال وعينة هادفة من ٦٨ طفل مصاب بإصابة بالرأس بعد دخولهم إلى قسم الطوارئ العامة خلال فترة الدراسة. حيث كشفت النتائج ان البرنامج التعليمي له تأثير إيجابي في تحسين معلومات وممارسات الممرضين حول كيفية فرز الاطفال و اصابات بالراس. وأوصت الدراسة بأن هناك حاجة إلي توفير ببرامج تعليمية شاملة للممرضين خاصة بعملية تصنيف الأطفال باعتباره دورًا جديدًا نسبيًا.