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Nurses' Knowledge, Perception Regarding the Implementation of Triage System in Pediatric Emergency Department at Gaza Strip

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Dedication

I dedicate this work to the Almighty Allah for preserving my life, ensure my security in Gaza strip and gave me good Health and strength to be able to do this work.

To my parents for their endless prayers and my family for their

encouragement. To my friends for supporting and encouragement.

To all martyrs and injuries in Palestine.

To every person help me to finish this work.

Ahmed w. Abu Seda

Declaration

I certify that this thesis submitted for the degree of master, is the result of my own research, except where otherwise acknowledged, and that this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:

Ahmed Waleed Abu Seda

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Abstract

Triage is an essential function of staff in emergency department. Nurses' knowledge about triage is decision making, and effective decision-making can influence the health outcomes of patients. The study aimed to assess the knowledge and perception of triage of nurses about triage system in pediatric emergency departments at governmental hospitals in Gaza Strip, and determine challenges to the implementation of triage system. The study utilized descriptive, cross-sectional, analytical design. The sample of the study consisted of 112 nurses (census) from eight pediatric emergency departments. For data collection, self-administered questionnaire was developed by the researcher with response rate 93.9%. Pilot study was implemented on 10 questionnaires, and the Cronbach alpha for reliability was 0.83 for knowledge domain, 0.75 for perception, and 0.65 for challenges. The researcher used SPSS (version 22) for data analysis. Statistical analysis included frequencies, means, standard deviation, (t) test, One-way ANOVA, and Pearson correlation test. The results showed that 76.8% of study participants were male nurses, 67.3% were married, 66% have bachelor degree, 41.4% have an experience less than 3 years, 61.6% were staff nurses, and 42% are working mixed shifts (day, evening, night). The results also indicated that 33% of nurses reported that they received training about triage system. Nurses expressed above moderate (76%) knowledge about triage system, high perception (81%), and moderate challenges (57%) to implement triage system in pediatric emergency departments. Conclusion and recommendation**:** There were significant negative relationship between perception and challenges. Factors that led to higher knowledge about triage included training, have bachelor degree, being a nurse manager, and being from EGH. While low knowledge found among participants from the age group 28 – 38, from Gaza and the north. Higher challenges reported among single participants, and living in Khanyounis and Rafah. No significant differences related to gender, experience, and work shifts. The findings revealed the need for training programs in order to improve nurses' knowledge and skills in performing triage of the patients at pediatric emergency departments.

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List of Abbreviations

AAP	American Academy of Pediatrics
ATS	Australian Triage System
CI	Confidence Interval
CPETS	Chinese Pediatric Emergency Triage Scale
CTMS	Computerized Triage Manchester Services
ECS ED	Emergency Care Services Emergency Department
EGH	European Gaza Hospital
EMS	Emergency Medical Services
ESI	Emergency Severity Index
ETAT	Emergency Triage Assessment and Treatment
GDP	Gross Domestic Product
GS	Gaza Strip
HCPs	Health Care Providers
HCWs	Health Care Workers
IUG	Islamic University of Gaza
KAP	Knowledge, Attitude, Practices
LOS	Length of Stay
MOH	Ministry of Health
MTS	Manchester Triage System
NGO	Non-Governmental Organization
NICE	National Institute for Health and Clinical Excellence
NSS	Nursing School Shifa
NTS	National Triage Scale
PCN	Palestinian College of Nursing
PICU	Pediatric Intensive Care Unit
RCN	Royal College of Nursing
RN	Registered Nurse
RR	Respiratory Rate
SATA	South Africa Triage System
SDI	Standard Discharge Instructions
SPSS	Statistical Package for Social Sciences
TATTT	Toowoomba Adult Triage Trauma Tool
UCAS	University College of Applied Science

UK	United Kingdom
UNRWA	The United Nations Relief and Work Agency
USA	United States of America
WB	West Bank
WHO	World Health Organization

Chapter One

Introduction

1.1 Background

Triage is an essential function of an Emergency Department (ED) and it is a term used to describe the sorting of patients for treatment priority in ED Also, the purpose and function of triage is to first identify patients with life-threatening or emergency conditions who cannot wait to be seen and initiate appropriate interventions, and then allocate the patient to the right area within the ED (Afaya et al., 2017).Triage at the Emergency Department (ED) aims to prioritize pediatric patients when clinical demand exceeds capacity (FitzGerald et al., 2010). As the burden on ED worldwide is steadily increasing, triage remains a fundamental intervention to manage pediatric patient flow safely and to ensure that pediatric patients who need immediate medical attention are timely treated, particularly in case of overcrowding, therefore identifying pediatric patients at a high risk of death is important in the ED to offer adequate treatment and to recognize patients in need of more intensive management and possible admission to pediatric intensive care unit (PICU) (Robert et al., 2014).

Triage is recognized as a central component of the ED and was first introduced in the 1950s in the USA (Melot , 2015). More recently, the need for triage systems was also identified in low-resource settings with reports showing that the process of triage can improve patient flow, reduce patient waiting times, and decrease mortality rate in these contexts (Bruijns et al., 2008).

A key goal of all publicly-funded health care systems is to deliver evidence-based care in the most cost-effective setting while achieving high-quality outcomes. To this end, diverting low acuity patients from the Pediatric emergency department (PED) to primary

care in the community is highly desirable. Lack of access to primary care is an obvious barrier to reducing low-acuity PED visits; however, Farion et al., (2015) showed that even among families with primary care providers, visits to the PED were common for low-acuity health problems, as families over-estimated the seriousness of their child's condition. Also, Early recognition and stabilization of acutely ill infants and children improves outcomes in all settings, regardless of resources. When resources are constrained, interventions which include the introduction of triage training and process, the use of clinical practice guidelines and the supervision and monitoring of patients lead to reduced mortality rates in critically ill children (Abdulmutalib et al., 2016). The acuity of patients presenting to PED varies widely. Although many children require only basic care, those with emergency medical conditions often experience delays in initial treatment. Consequently, their conditions deteriorate, resulting in admissions that may have been avoidable (Ayieko et al., 2011).

Nurses' knowledge and experience about triage have been cited as influential factors in triage decision-making, many triage education programs are underpinned by the assumption that knowledge acquisition will result in improved triage decisions. Therefore the triage nurse's ability to make accurate clinical judgments about patient urgency and their need for intervention are essential to the delivery of safe and effective emergency care, including triage, is often one of the weakest parts of the health system in low-income countries as compared to industrialized countries; but if well-organized it can be life-saving and cost- effective care . On the other hand, there are many hospitals in low-income countries lack a formal triage system. Clinicians usually see the patients on a 'first-come-first-served' basis, there is often no ED and patients are seen in either the wards or the outpatient clinic when they arrive. This results in potentially deadly delays for critically ill patients. Once a patient has been identified as being critically ill, there can be further delays in initiating emergency treatment (Robert et al., 2014).

1.2 Problem statement

From the researcher experience with in three years of working at Nasser Pediatric ED in Gaza Strip hospitals, the researcher observed that it was very crowded especially after 2:00 PM, when the United Nations Relief and Work Agency (UNRWA) and governmental primary health care centers are closed with overcrowded conditions and the length of child stay at ED that sometimes reach too long hours to see doctor. The number of patients arriving at PEDs has increased over the past few years in Gaza partly because of self-referrals, and for economic reasons include low salaries because the nonprophetic care services at the governmental hospitals this reason resulting in overcrowding at PED. This raised a concern of the need for a system that prioritizes patients in the order of urgency. Nurses weak knowledge and wrong perception about triage system lead to wrong implementation that usually see the patients on afirst-come-first-served basis. This practice does not create room for critical and emergency cases to be managed immediately. Presently most of PEDs at Gaza hospitals have triage system that un implemented or wrongly used by nurses and doctors because of deficiency of knowledge or wrong perception about triage rules, colors and waiting time.

1.3 Justification

Few studies have analyzed the nurses' knowledge and perception of nurses about emergency triage care services in pediatric emergency settings. Also, the importance of studying the implementation of the emergency triage system in the emergency department in the Gaza Strip as a special due to the overcrowding of cases in the PEDs, and also because of the difficult and exceptional conditions experienced by the health system in the Gaza Strip due to lack of professional staff, equipment and capabilities. The result of this study will help to improve the quality of care at pediatric emergency departments by

discover the need for implementation of pediatric triage system, reach family satisfaction, and could provide guidelines for another emergency department concerning the implementation of a triage system. The need of emergency triage system implementation in these departments is shown here, because it has a direct effect on the quality of health care provided and on patient and family satisfaction about health care service at the hospitals of the Palestinian Ministry of Health. Locally, to date, there was no previous studies related to this topic and it's the first time to accomplish this research among pediatric emergency nurses in Gaza strip. Globally, there were several studies dealt with this subject in many countries like United Kingdom, south Africa, United Arab Emirate, and other countries. So, the researcher wants to determine whether the implementation of the Triage System in the pediatric emergency department enhanced the quality of emergency care, according to the perceptions of nurses working in this departments. The result also enhances the triage skills, practice and knowledge of nurses, continuing education and training courses related to triage and other nursing skills advanced management of medical emergencies are key aspects to improve quality care and patient safety. Receptionists and administrative staff members should be orientated about the triage process. Future studies should conduct two investigations, before and after the implementation of the PED triage, in a specific unit. This will produce comparative data and enable the calculation of correlation statistics for new studies. Finally, the findings of this study could serve as guidelines for research prior to the future implementation of the same or similar triage systems in other emergency units.

1.4 Research objectives

1.4.1 General objective

The study aim to assess nurse's knowledge and perception regarding the implementation of triage system in pediatric emergency department at Gaza Strip.

1.4.2 Specific objectives

1- To determine the nurses' knowledge about the triage of patients.
2- To identify the nurses' perception about triage system.
3- To identify the challenges for implementation of pediatric triage system
4- To Investigate the relationship between nurse's knowledge level and their perception about triage implementation.
5- To investigate the relationship between nurse's knowledge, perception and their qualification
6- To observe the relationship between nurse's knowledge, perception and their sociodemographic characteristics
7- To suggest recommendations for the further improvement of the newly implemented triage system.

1.5 Research questions

1- What is the level of nurses' knowledge about the implementation of triage at PED?
2- What is the level of nurses' perception about the implementation of triage at PED?
3- What are the challenges for triage implementation at pediatric ED?
4- Is there a relationship between nurses' knowledge, perception about triage implementation?

5- Is there a relationship between nurses' knowledge and their qualification?
6- Is there a relationship between nurses' knowledge and their sociodemographic characteristics?
7- Is there a relationship between nurses' perception and their sociodemographic characteristics?
8- Is there a relationship between nurses' perception and their triage challenges?
9- Is there a relationship between nurses' knowledge and triage course attending?

1.6 Context of the study

- Sociodemographic context

Palestine lies within an area of 27,000 square kilometers (Km2), expanding from Ras al-Naqoura in the north to Rafah in the south (Annex 1). Palestinian territories is divided into three areas separated geographically; the West Bank (WB) 5.655 Km2, Gaza Strip (GS) 365 Km2 and East Jerusalem. Based on estimates prepared by the Palestinian Central Bureau of Statistics (PCBS), the estimated population in Palestine is approximately 4.95 million. Male gender consists of 2.52 million while female gender consists of 2.43 million. The estimated population in the WB is about 3.01 million, including 1.53 million males and 1.48 females, while the population in GS is estimated to be over 2 million, including approximately 988,000 males and 956,000 females. The population density (capita/km2) is 823 (532 in WB and 5324 in GS) (PCBS, 2018). Latest reports in August 2018 demonstrated that total population is 5,065 million with male to female ratio 103.4:100, and 73.6% of the population is urban, and the median age is 19.6 years (www.worldometers, 2018). Natural increase rate accounts for 2.8 (2.5 in WB and 3.3 in GS), life expectancy for males 72.1 years and for females 75.2 years, average household size 5.2 (4.8 in WB and 5.7 in GS), total fertility rate 4.1 (3.7 in WB and 4.5 in GS), infant

mortality rate 18.2 (17.0 in WB and 19.6 in GS (PCBS, 2018).

- Economic context

The Palestinian economy suffers from continuous pressure caused by long-term siege, imposed by Israeli occupation for more than 12 years. Economic status in the Palestinian territories is very low. A significant increase in poverty rates occurred in GS from 38.8% in 2011 to 53% by the end of 2017 , Also Gross Domestic Product (GDP) is estimated about 440.2$ (576.0 in WB and 248.7 in GS), unemployment rate accounted for 18.2% in WB and 41.7% in GS and for female's unemployment rate is 44.7% (29.8% in WB and 65.2% in GG) (PCBS, 2018).

- Health care system in Palestine

The Palestinian health system consists of different parties. The main parties that offer health services are the MOH, Non-Governmental Organization (NGOs), UNRWA, the military health services, and the private sector. The total number of hospitals in Palestine is 83 hospitals, 51 of them in WB including east Jerusalem and 32 in GS. The number of hospitals owned by MOH in Gaza strip is 13 hospitals, 16 for NGOs, 2 for the Ministry of Interior and National Security and 1 for the private sector. The number of hospital beds in the Gaza Strip reached 2,943 beds (2,240 beds belonging to the Ministry of Health, 526 beds belonging to non-governmental institutions, and 177 beds belonging to the Ministry of Interior and National Security).The number of physicians working in different centers and units of MOH is 3100 physicians, with 14.6 physicians per 10,000 population of Palestine in GS, and the number of nurses working in MOH in GS is 3682 nurses representing 25.1 % of total employees in MOH, with 21.2 nurses per 10,000 population of Palestine in GS .The number of visitors to emergency departments in 2017 was 1,402,222

visitors (MOH, 2018).

- **Martyr Mohammed Al-Durra Hospital**

Martyr Mohammed Al-Durra Children's Hospital is a hospital that provides general pediatric services in Gaza City. The hospital has a clinical capacity of 100 beds. It is located in Salah El-Din Street. It was built in 2000 on an area of 1600 square meters, serving the areas of Al-Shuja'iya, Al-Shaaf and Al-Daraj neighborhood. Al-Zaytoon and Al-Tuffah neighborhood, the hospital consists of four departments: a pediatric emergency department and two internal department for children and intensive care. Martyr Mohammed Al-Durra Children's Hospital is the first center for pediatric cardiology in Palestine in addition to general pediatric services and intensive care (MOH, 2018).

- **Al-Nasr Hospital**

Established in 1962, Al-Nasr Children's Hospital, with an area of 4400 m2, is the oldest and largest children's hospital in the Gaza Strip. It is located in Al-Nasr neighborhood, and it serves a large area of Gaza City and some of its services extend to the central and northern area in the Gaza Strip, with a capacity of 132 beds and a total hospital staff of 294 employees, the hospital's mission is to provide health services to children from birth to 12 years of age (MOH, 2018).

- **Al-Aqsa Martyrs Hospital**

Al-Aqsa Martyrs Hospital is the only governmental hospital in the central region, serving more than 300,000 people. General hospital provides medical and surgical services, women, obstetrics and pediatrics. The population of Middle governorate has a clinical capacity of 129 beds, of which 103 beds are reserved for hospitalization. The staff is 562

employees of all categories (MOH, 2018).

- **Nasser Medical Complex**

Medical Complex includes Naser hospital, which is dedicated to surgery, internal medicine, Al-Tahreer hospital for women, childbirth and children, and Al Yassin hospital, it located in Khan Younis. Khan Yunis governorate has a total clinical capacity of 322 beds, with a total of 769 employees. Al-Tahreer Hospital was opened in 1999 and covers an area of 1800 square meters. The hospital has a pediatric emergency department, and two internal department for children, it includes 64 beds for children, It also has a special care baby unit for newborns. It also has a maternity department with 90 beds for maternity cases, it also has two rooms for obstetrics and gynecology (MOH, 2018).

- **European Gaza Hospital**

European Gaza Hospital is located in Khan Younis governorate. The total area of the hospital buildings is 20,000 square meters. Gaza European Hospital is a distinguished center providing medical services in the second and third level of the southern region. The hospital serves a population of 500,000 following international standards of medical care. The European Gaza Hospital is a model of administrative operations, particularly in the optimal use of information technology and the development of comprehensive medical records management and financial management systems. A large public hospital with a total clinical capacity of 256 beds, of which 203 beds are allocated for overnight use. The population in the southern governorates of the Gaza Strip is particularly distinguished by providing heart catheter service to all governorates of the Gaza Strip. The total number of hospital staff is 781 employees (MOH, 2018).

1.7 Theoretical and operational definitions:

Triage 'Triage' is derived from the French word 'trier' which means to 'pick or to sort'. Patients or problems are thus sorted according to their degree of seriousness – their need for treatment – and the available resources to offer the treatment (Augustyn et al., 2009). In this research, 'triage' is the prioritizing (by an assigned nurse or doctor) of patients who arrive at the participating emergency unit

Emergency 'emergency' means any physical, psychological or medical condition admitted to the emergency unit. The emergency unit refers to a well- equipped level II accident and emergency facility of a private hospital with a two-bed resuscitation room with overhead gantry x-rays; one-bed isolation room; two-bed overnight room; one general emergency room area with eight beds/patient cubicles; triage room two doctors' consultation rooms and a reception/waiting area with 34 chairs (Augustyn et al., 2009). The researcher adopt this definition as operational definition

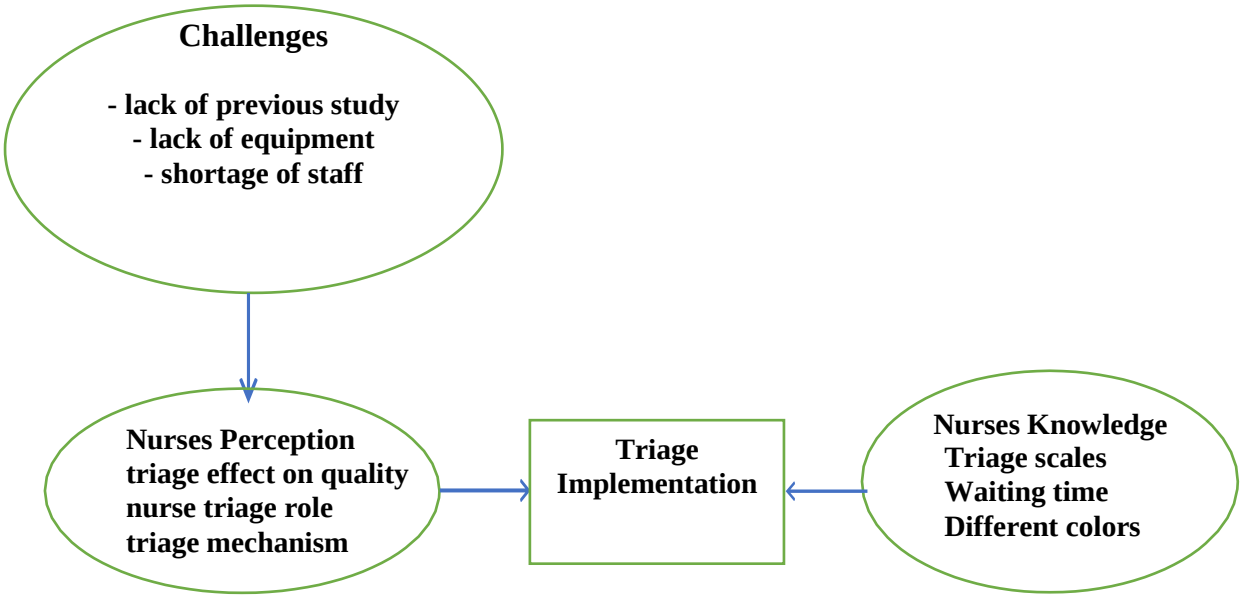
Knowledge: Knowledge is often defined as a belief that is true and justified. This definition has led to its measurement by methods that rely solely on the correctness of answers. A correct or incorrect answer is interpreted to mean simply that a person knows or does not know something (Hunt, 2010). The researcher adopts this definition as operational definition, and it will be measured by true and false question.

Perception: Perception can be defined as our recognition and interpretation of sensory information. Perception also includes how we respond to the information. Or can think of perception as a process where person take in sensory information from our environment and use that information in order to interact with our environment. Perception allows us to take the sensory information in and make it into something meaningful, (Haghigh et al.,

2017) in this research perception demonstrate nurse's recognition about triage implementation, and it will be measured by eleven Likert scale question.

Challenges: challenges always defined as something new and difficult which require great effort and determination or ideas, also defined people you question their truth, value or authority (Haghigh et al., 2017). In this research the researcher defined challenges as all things that face or defense and interrupts the implementation of pediatric triage system.

1.8 Conceptual Framework



Source: (Melot, 2015)

Figure (1.1): Conceptual Framework

In this study the independent factor was (nurse's knowledge, perception and triage challenges). Also, the dependent variable was (triage implementation). The researcher mentions that on the figure above triage challenges as: lack of previous study, lack of equipment and -shortage of staff. (Melot, 2015).

Chapter Two
Literature Review

2.1 Background

The process of triage decision-making is influenced by three interrelated factors: the characteristics of the patient, the triage decision-maker and the health care setting. Triage is important for redistributing and reducing waiting times and admission rates, increasing the efficiency and effectiveness of the ED, enhancing patient and family satisfaction, improving the quality of health care, managing funding and assessing the effectiveness of ED activities, While the importance of triage in the ED has been recognized for some time in developed countries, less developed countries, including those of the EMR, are not utilizing the full potential of this health developmental trend. The EDs of psychiatric hospitals especially have much progress to make to realize the benefits of triage (Whitby et al., 2015)

2.2 Triage and health professionals

Triage is usually performed in the ED by nursing staff who allocate a triage designation and initiate emergency care before the patient is examined by a doctor. Triage may be done by ED physicians as well. In prehospital disaster sites, ambulance personnel also need to use triage to prioritize multiple cases for immediate mass evacuation for emergency medical help in nearby hospitals. Triage nurses usually have advanced training in decision-making. They have been shown to have the necessary skills to make appropriate triage decisions and provide a highly effective service to ED patients in health care settings, also Many patients arriving at the ED have complex problems that need several investigations, procedures or consultations. Triage nurses can validly and reliably estimate the complexity of such cases, guide ED workflow and casemix system analysis (Cioffi, 2014).

In a study of decisions about appropriate care provider, priority rating and preliminary investigations for ambulatory patients the level of agreement between the triage nurses and physician observers was 81% and between the triage nurses and treating physicians was 94%. Triage nurses identified a greater number of patients (19%) as having emergency problems (17%), and fewer patients (45%) as having problems of a non-urgent nature compared with physician observers (47%). The study concluded that experienced emergency nurses in the role of triage were safe, efficient and cost-effective, with statistically significant levels of safety and accuracy of priority rating when compared to triage physicians and treating physicians. Also, the increasing use of triage and the increasing numbers of ED visits by patients raises the important issue of a parallel need to increase the number of triage nurses in EDs (O'Brien, Irvin and peereboom, 2010)

2.3 Triage scales

Australian Triage Scale (ATS)

Different triage scales have been developed to help health professionals to classify ED patients consistently and to achieve acceptable health outcomes. Triage scales usually have 3 to 5 categories, with algorithms or protocols or sentinel diagnoses as the anchor points for making decisions, supported by triage guidelines and procedures. They are now generally supported by computer-based programs and web-sites which are faster and more effective aids to prioritization and decision-making. The most commonly used scale is the Australian Triage Scale (ATS), which has 5 categories with their corresponding level of treatment acuity (scale table). The ATS is derived from the National Triage Scale (NTS) for Australasian emergency departments, the 2 scales differing in the description and allocation of the 5 categories. In a study in Belgium, the NTS was reported to have good predictive validity (Van Gerven et al., 2001). This triage scale who implemented of gaza ED. Also, recently used at PED.

(Yousif et al. 2015) reported that use of the ATS had a significant impact on the triage distribution of ED patients compared with the NTS, with 28% and 24% increases in patients with categories 2 and 3 respectively and 15% and 67% decreases in patients with categories 4 and 5, respectively. The ATS is therefore better suited to meet performance criteria and case mix assessment.

Toowoomba Adult Triage Trauma Tool (TATTT)

Another scale from Australia is the Toowoomba Adult Triage Trauma Tool (TATTT), which is a computerized algorithmic clinical-decision support tool designed for use on a handheld personal computer. It is well accepted by users and is seen as a viable alternative

to current triage practice. The TATTT incorporates ATS categories but largely replaces the associated clinical indicators and provides an evidence-based valid and consistent method of triage assessment and categorization of trauma patients (Dann, 2005).

Manchester Triage System (MTS)

The other international triage scales in common use are the Manchester Triage System (MTS) with its new updated version, the Emergency Severity Index (ESI) used in the United States of America and the Canadian Emergency Department Triage and Acuity Scale (CTAS) and its web-based triage tool (etriage), ambulance personnel use disaster triage based on the Homebush Triage Standard Taxonomy in prehospital settings, which includes battlefields, accident and trauma sites and places of massive fires also mental health triage scales have also been developed for triaging ED patients with mental disorders because the triage scales mentioned above have little capacity for triaging mental patients. Psychiatric nurses have been shown to use these scales effectively in the EDs of psychiatric hospitals (Broadbent et al., 2007).

2.4 Triage outcomes

There are two stages to the nurse triage process: first, the triage assessment which leads to allocation of a triage category and the subsequent processing of the patient; and secondly, the initiation of nursing interventions to facilitate emergency care with a possible reduction in the patient's discomfort. These triage decisions are linked with three types of outcome: "correct" or "expected" triage, "over-triage" and "under-triage". Correct triage by a nurse is associated with a positive health outcome because the patient is evaluated by a doctor within a suitable timeframe. Over-triage and under-triage indicate that triage nurse allocated a triage category of a higher or lower acuity than required respectively. Outcomes associated with over- or under-triage result in inappropriate allocation of ED resources,

prolonged waiting times for patients, and development of dangerous complications or prolonging suffering. Notably, funding models or incentive programs for triage are considered unethical (Gerdtz and Bucknall, 2010).

2.5 Effect of triage on waiting times

Nurse triage aims to redistribute the workload of the ED. The key issue is not increasing or reducing waiting times overall but the effectiveness with which triage nurses allocate shorter waiting times to the highest priority patients, thus redistributing patient waiting times according to need. Waiting times in the ED affect patients' satisfaction with care but may also have serious complications that adversely affect health outcomes. Prolonged waiting times at triage sites are the most common reason for patients' and families' dissatisfaction with ED care. Accordingly, patients need to understand, perhaps via educational campaigns, which medical problems are appropriate to present to the ED and also be informed about the waiting times that correspond to the category of urgency they are allocated (McMillan et al., 2014).

2.6 Education for triage

According to many studies, specialty education and continuing training in triage are the cornerstones of the triage system and contribute considerably to the correct triage decisions that are essential for good health outcomes. Continuing training but not experience was found to influence triage decision-making, so Prior to adopting a triage role, nurses should have both adequate specialist training and experience in the triage system .Studies in the United States and Australia concluded that triage nurses have wide variability in their degree of experience, preparation and orientation for the triage role, and insufficient education and training. Hospitals also vary in their requirements for training and experience before triage duties are performed. In view of the variability in triage training

and experience, there is a worldwide need to develop uniformly tailored triage education curricula and triage guidelines, as well as continuing training and research in triage systems. Triage guidelines coupled with triage education and training helps triage nurses to prioritize ED patients in all health care settings including psychiatric EDs. No triage guidelines, however, are perfect in predicting which patients are true emergencies (Kelly and Richardson, 2010).

2.7 Triage effect on quality improvement

The quality measures for triage systems that have been explored in several studies include the reliability of triage rating scales, waiting times, admission rates, accuracy of allocation of categories and rates of sentinel events/diagnoses (outcomes unrelated to the natural course of the patient's illness or underlying condition). Notably each quality indicator has some disadvantages, such as the use of sentinel diagnosis, which can be made only after extensive interviewing and evaluation, which adversely affects waiting times. Inconsistency in application of various triage scales is another concern for quality improvement in triage systems. Quality standards in ED can be maintained and enhanced by audits of the triage system. Notably, a study of the resource implications of nonurgent patients in the ED showed that 7.3% of all patients requiring admission came from the group identified as nonurgent by the CTAS triage system and hence strategies diverting them elsewhere might be unsafe and were unlikely to improve access for more urgent patients (Broadbent et al., 2007).

2.8 International Studies

Afaya et al., (2017) conducted a study was "Perceptions and Knowledge on Triage of Nurses Working in Emergency Departments of Hospitals in the Tamale Metropolis, Ghana "The study aimed to assess the perceptions and knowledge of triage of nurses working in

the ED of hospitals in the Tamale Metropolis, Ghana. The study revealed that 62.6% of the respondents were knowledgeable about triage by correctly answering more than 50% of the questions, in the self-administered questionnaires. Majority of nurses (96%) in the ED of the various hospitals had a very good perception about the importance of triage to the patient, care provider and the country at large. Current findings showed that as the nurses had increased years of working experience their triage knowledge level also improved. The current study findings revealed a little above average percent score (62.6%) about triage knowledge among nurses. To improve on this, workshops/in service training should be carried out, followed by continuous professional development on a regular basis for nurses in the ED.

Hammad et al, (2017) conducted a study was " Emergency nurses' knowledge and experience with the triage process in Hunan Province, China" A sample of 300 emergency nurses was selected from 13 tertiary hospitals in Changsha and a total of 193 completed surveys were returned (response rate = 64.3%). The result of the study is Just over half (50.8%) of participants reported receiving dedicated triage training, which was provided by their employer (38.6%), an education organization (30.7%) or at a conference (26.1%). Approximately half (53.2%) reported using formal triage scales, which were predominantly 4- tier (43%) or 5-tier (34%). They concluded that the findings highlight variability in triage practices and training of emergency nurses in Changsha. This has implications for the comparability of triage data and transferability of triage skills across hospitals.

Robert et al., (2014) conducted a study " Assessment of knowledge and skills of triage amongst nurses working in the emergency canters in Dar es Salaam, Tanzania" The purpose was to assess the triaging knowledge and skills of nurses working in the ECs in

Dar es Salaam, Tanzania. The Results was: Thirty three percent (20/60) of the respondents were not knowledgeable about triage. Thirteen percent of the respondents reported that although they had attended workshops, there had been a lack of information on how to triage patients. More than half (52%) of the respondents were not able to allocate the patient to the appropriate triage category. Fifty eight percent (35/60) of the respondents had no knowledge on waiting time limits for the triaged categories. Among the four hospitals observed, only one had nurses specifically allocated for patients' triage. The respiratory rate of patients was not assessed by 84% of the triage nurses observed. No pain assessment was done by any of the triage nurses observed. Only one out of four ECs assessed had triage guidelines and triage assessment forms. Also, Nurses who participated in this study demonstrated significant deficits in knowledge and skills regarding patients' triaging in the EC. To correct these deficits, immediate in-service training/education workshops should be carried out, followed by continuous professional development on a regular basis, including refresher training, supportive supervision and clinical skills sessions.

Duko et al., (2019) conducted a study "Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia the result of the study was: Among the study participants, 57.4% were female and 87% were in age group of ≤ 30 years. 51.5% had low triage knowledge scores, with the mean score being 9.54 ($SD = 2.317$), 76.2% perceived their overall triage skill to be at good level, with mean score 95.75 ($SD = 9.562$). Working experience of study participants ($\chi 2 = 15.204$, $p < .01$), Educational level of study participant ($\chi 2 = 22.148$, $p < .01$) and triage experience ($\chi 2 = 13.638$, $p < .01$) were factors associated with triage knowledge. Working experience ($\chi 2 = 7.944$, $p < .05$) and triage experience ($\chi 2 = 6.264$, $p < .05$) were factors associated with triage skill.

Aghababaeian et al., (2017) conducted a study was" Evaluating Knowledge and Performance of Emergency Medical Services Staff Regarding Pre-Hospital Triage" the aim of the study is to determine the knowledge and performance of EMS staff regarding START pre-hospital triage in 2016. The result: 117 individuals with the mean age of 33.21 ±6.08 years and mean job experience of 7.35 ± 4.32 years participated all of whom were male. Mean knowledge of the studied population regarding triage was average (mean score: 9.44) and their performance score revealed that their performance was also average (mean score: 9.58). they Concluded that: Based on the findings of the current study, knowledge and performance of EMS staff in north of Khuzestan province was average regarding pre-hospital triage.

Haghigh et al., (2017) conducted a study was " A Survey on Knowledge Level of the Nurses about Hospital Triage": Results: Finally, the knowledge of triage in nurses from different areas showed that 36 nurses (51.4%) had low level while only 31 nurses (44.3%) had a moderate level of knowledge about triage. They Concluded that: Awareness of ED Nurses who were involved in the Triage of Patients were assessed as undesirable. The result was: requires emergency department in the use of a valid and reliable scale to increase consensus in decision-making with equipment that train, manpower and use of equipment necessary for triage.

Küçükoğlu et al., (2017) conducted a study was "evaluation of the knowledge of triage among nurses working in emergency department " This study was conducted to measure the level of knowledge of triage among nurses working in pediatric emergency and general emergency departments. The results were: In the study, the vast majority of nurses stated that they did not receive triage education during (51.3%) and after (72.1%) their college education. A statistically significant difference was found between the education level of

the nurses and their triage practices ($p<0.05$). It was found that 72.7% of the nurses did not consider themselves qualified to perform triage, and 68.2% believed that triage was among the duties of emergency care nurses. It was also determined that the physical environment of the emergency department, the ability of personnel to triage and the absence of specialist physicians and nurses were factors affecting triage practice ($p<0.05$). they Concluded that: It was determined that the majority of nurses working in emergency departments did not receive triage education, did not consider themselves competent on triage and that triage practice should be supported through in-service training.

Mistry et al., (2018) they conducted a study " Nursing Perceptions of the Emergency Severity Index as a Triage Tool in the United Arab Emirates. The result was :Interview coding revealed 7 core themes related to use of the ESI (frequencies indicated in parentheses): ease of use (90), speed and efficiency (135), patient safety (12), accuracy and reliability (30), challenging patient characteristics (123), subjectivity and variability (173), and effect of triage system on team dynamics (100). Intercoder agreement was excellent (Cohen's unweighted kappa = 0.84). Subjectivity and variability in ESI score assignment consistently emerged in all interviews and included variability in number and use of resources, definition of "high risk,"nursing experience, and subjectivity in pain assessment. They concluded that Contribution to Emergency Nursing practice: This qualitative analysis of nursing perceptions of the emergency severity index (ESI) highlights the importance of nursing input when implementing triage systems and describes perceived barriers and strengths when using the ESI. Also, Knowledge of these specific factors may prove useful in the development and implementation of triage systems in emergency departments around the global.

Hussein and Hassan (2019) conducted a study " Effectiveness of Education Program in Nurses' Practices about triage system in Emergency Department at Qalat Salih Hospital "The aim of the study is to assess the effectiveness of an educational program on Nurses' Practices about the triage system in Emergency department of Qalat Salih Hospital. the results was: there were highly significant differences between pre and post-tests in the study group in overall main domains related to nurses' practices they concluded that : the effectiveness of educational program regarding nurses' practice concerning the triage system in emergency department of Qalat Salih Hospital is significance and there are large differences in pre-test than post-test in improvement the nursing staff regard to program of the triage system. Also, the Recommendation was: The nurses' staff can be encouraged and motivation for being participated in the special training programs and conference with the triage system specialists who have long experience in practices of the triage procedure to fulfil the nurses' needs related the triage system in their practices.

Lin et al., (2016) conducted a study " Implementation of a Pediatric Emergency Triage System in Xiamen, China " The aim of this study was to evaluate the clinical value of a new five-level Chinese pediatric emergency triage system (CPETS), modeled after the Canadian Triage System and Acuity Scale In this study, we compared CPETS outcomes in our PER relative to those of the prior two-level system. they concluded that: Implementing the CPETS improved nurses' abilities to triage severe patients and, thus, to deliver the urgent treatments more quickly. The system shunted nonurgent patients to outpatient care effectively, resulting in improved efficiency of PER health-care delivery.

Genisca et al., (2018) conducted a study was "Healthcare Provider Attitudes toward the Emergency Triage System in Belize" the aim of the study: To explore healthcare providers' (HCP) attitudes toward the current triage system prior to national pediatric

triage implementation. The result: 16 HCPs (7 physicians and 9 nurses) participated after ETAT training and 24 HCPs (15 physicians and 9 nurses; 11 [68%] from first focus groups) participated one year later. The following principal themes emerged regarding current triage systems: The initial groups stressed (1) the importance of triage education and implementation to standardize and improve communication by using a unified language between HCPs (2) desire to implement a simple, low-resource pediatric-specific triage system and (3) major limitations of ESI included the difficulties of assessing pediatric patients due to its complexity and lack of pediatric specific criteria as well as dependence on equipment that is not consistently available. they expressed interest in developing a triage system based on ETAT. Conclusions: Participants feel that triage education and implementation is essential to improve communication and pediatric emergency care and agree that a national pediatric triage system would be beneficial. Prior to triage implementation all staff should be educated in the new process. When choosing which system to use a simple, low-resource pediatric- specific system, like ETAT, may improve utilization by staff providing faster recognition of and improved care for acutely ill children. These beliefs should be considered when addressing triage implementation.

Abdoos et al, (2016) conducted a study " Impact of Training on Performance of Triage: A Comparative Study in Tehran Emergency Department ". they assessed the effect of training of triage nurses in Tehran Emergency Department on efficiency and accuracy of triage decision making. Findings: The total frequency of dispatches based on new international guideline was significantly lower than based on the routine protocol (84% vs. 46%) ($P < .001$). In addition, the proportion of correct dispatches was found to be significantly higher than those by the untrained group (75% vs. 20%) ($P < .001$). Further, frequency of correct triage by trained group turned out to be significantly higher than by the untrained group (80% vs. 30%) ($P <.001$). They Concluded that: Our study provides direct evidence

for the positive impact of updated training on improved performance of triage process and encourages similar interventions to achieve higher efficiency in emergency departments.

Akinaga et al., (2017) conducted a study " Study on Triage Education for Nursing Students" The purpose of this study is retrospectively to examine some mis-categorized cases to identify causes of triage errors, and thereby inform the future design of courses for triage education(START is a system of primary triage performed on casualties at the scene of a mass-casualty incident. The results of the study showed that most students were likely to answer the triage questions largely based on their perception of visual information (such as video images) rather than on triage criteria.

Sherafat et al., (2019) conducted a study "The Experiences of Healthcare Staff about Triage in Emergency Departments: A Qualitative Study "this study was conducted to investigate the role of different underlying factors in triaging emergency patients through a qualitative approach. The result: Four categories of profit triage, exhibitive triage, enigmatic, and tentative performance triage were drawn from the data, collectively comprising the main theme of responsibility-evading performance. They concluded that: The dominant approach to the triage in the emergency departments in a central city of Iran is responsibility evasion; however, the triage is performed tentatively, especially in critical cases. To achieve a better implementation of triage, consideration of the underlying factors and prevention of their involvement in triage decision-making is necessary.

Recznik and Simko (2018) conducted a study " Pediatric triage education: An integrative literature review "The objective of this study was to review the currently published literature on the topic of pediatric triage education. The result was: A wide variety of pediatric triage educational methods exist, but studies with the highest-quality ratings most often used simulation programs or a standardized curriculum. Although there was a good

deal of heterogeneity in terms of the outcomes measured, the accuracy of triage improved following educational interventions. they concluded that: Additional research is needed to compare different methods of pediatric triage education directly. Emergency nurses should be aware that pediatric triage is a high-risk event, and some educational methods may have advantages over others. In addition, although retention of pediatric triage skills is affected by the method and timing of pediatric triage education, emergency nurses should remain aware that improved pediatric triage skills could lead to improved pediatric outcomes, and target this as an area for further research.

Allen et al., (2015) conducted a study " Accuracy and interrater reliability of pediatric emergency department triage" the aim of the study: To determine the accuracy and reliability of triage of children in public hospital EDs using the Australasian Triage Scale (ATS). The result of the study: Triage nurses correctly assigned triage scores to an average of 5.3 of nine pediatric clinical scenarios. Accuracy in specific hospitals ranged from a low of 15% on one scenario, to 100% accuracy on a different scenario at a different hospital. Interrater reliability within and across the EDs studied was found to be kappa = 0.27. Both accuracy and interrater reliability were marginally higher at the specialty pediatric hospital. They concluded that: Our findings demonstrate inconsistencies in the accuracy and reliability in which sick children presenting to EDs receive triage scores both within and across hospitals. These results suggest the need for improvements either in current triage nurse training or training resources. Use of the ETEK alone has not resulted in high levels of pediatric triage accuracy or reliability.

Sara et al., (2018) conducted a study "A descriptive study of registered nurses' application of the triage scale RETTS©; a Swedish reliability study" the aim of the study was to determine the reliability of application by registered nurses of the triage scale in two

Swedish emergency departments. The result of the study: The RNs allocated 1281 final triage levels. There was concordance in seven (15%) of the scenarios, and dispersion over two or more triage levels in 39 (85%). Dispersion across the stable/unstable patient boundary was found in 21 (46%) scenarios. Fleiss κ was 0.562, i.e. moderate agreement. They concluded that: The inability of the triage scale to distinguish between stable/unstable patients can lead to serious consequences from a patient safety perspective. No general pattern regarding concordance or dispersion was found.

Cristina et al., (2018) conducted a study "Configurations of factors affecting triage decision-making". The purpose of this paper is to explore the configuration of factors affecting the accuracy of triage decision-making. The results of this study show that the interplay between individual and contextual/organizational factors determines the emergence of errors in triage assessment. Furthermore, there are some regularities in the patterns discovered in each of the investigated organizational contexts. These findings suggest that we should avoid isolating individual factors from the context in which nurses make their decisions. The value of the study: Previous research on triage has mainly explored the impact of homogeneous groups of factors on the accuracy of the triage process, without considering the complexity of the phenomenon under investigation. This study outlines the need to consider the not-linear relationships among different factors in the study of triage's decision- making.

Delnavaz et al., (2018) conducted a study "Comparison of scenario-based triage education by lecture and role playing on knowledge and practice of nursing students"The objective of this study was to compare the effect of educating emergency severity index (ESI) triage using lecture and role-playing on the knowledge and practice of nursing students. The results showed the effectiveness of both educational methods on students' learning.

However, the role-playing method was more effective than the lecture method and is recommended for triage education. In addition, according to the importance of triage, developing the theoretical and practical education courses for nursing students is recommended.

Jordi et al., (2015) conducted a study "Nurses' accuracy and self-perceived ability using the Emergency Severity Index triage tool": a cross-sectional study in four Swiss hospitals. They concluded that Low accuracy of ESI score assignment was observed when nurses scored an ESI for 30 standard written case scenarios, translated into nurses' native language, despite a good inter-rater reliability and high nurse confidence in their ability to apply the ESI. Although feasible, using standard written case scenarios to determine ESI triage scoring effectiveness may not be the optimum means to rate nurses' triage skills.

Aeimchanbanjong and Pandee (2017) conducted a study "Validation of different pediatric triage systems in the emergency department" This study aimed to determine the best triage system in the pediatric emergency department. This was a prospective observational study., we included 1 041 participants with average age of 4.7±4.2 years, of which 55% were male and 45% were female. In addition, 32% of the participants had underlying diseases, and 123 (11.8%) patients were admitted. We found that ESI illustrated the most appropriate predicting ability for admission with sensitivity of 52%, specificity of 81%, and AUC 0.78 (95%*CI* 0.74–0.81). They concluded that: RTS illustrated almost perfect inter-rater reliability. Meanwhile, ESI and CTAS illustrated good inter-rater reliability. Finally, ESI illustrated the appropriate validity for triage system.

Wolf et al., (2018) conducted a study was " Triaging the Emergency Department, Not the Patient: United States Emergency Nurses' Experience of the Triage Process" The purpose of this study was to explore emergency nurses' understanding of—and experience with—

the triage process, the result of the study was: our participants described processes that were unit- and/or nurse-dependent and were manipulations of the triage system to “fix” problems in ED flow, rather than a standard application of a triage system. . Contribution to Emergency Nursing Practice was: This study explored the experience and understanding of triage as a nursing process in emergency setting, A better understanding of how environmental constraints affect the decision-making capabilities of emergency nurses finally, Clear metrics and assessment mechanisms for triage competencies.

Hardy and Calleja (2018) conducted a study was " Triage education in rural remote settings: A scoping review" The purpose of this review was; to discover how effective education support programs were in developing clinical decision-making skills for graduates at triage; and to determine what is known about triage education support programs for graduate or novice registered nurses undertaking triage in rural and remote settings. They concluded that: This review demonstrates significant gaps in the literature reporting on this topic area, particularly in the rural context. Common recommendations include standardized triage education strategies, and strategies that account for differences in resourcing levels. Further research is required to attempt to link education strategies in rural contexts to acceptable triage outcomes like triage accuracy.

Firouzkouhi et al., (2017) conducted a study was" Experiences of civilian nurses in triage during the Iran-Iraq War: An oral history. These studies aimed to investigate the triage experiences of civilian nurses during the Iran-Iraq War. The result was: Four themes were extracted from the data, which were the development of triage, challenging environment to perform triage, development of mobile triage teams, and challenges of triage chemical victims for nurses. They concluded that: Triage is an important skill for nurses to manage critical situations such as disasters and wars. Nurses have to be competent in performing triage. Involvement in critical situations helps the nurses learn and gain more experience on how to manage unexpected events.

Natareno (2018). Conducted a study was"Disaster Knowledge and Awareness of Nurses Related to Triage in Mass Casualty Incidents" summary as: American life, as we know it, is changing. Disasters are increasing in frequency. Over the past decade, more than two million people has lost their lives. This quality improvement project evaluated the effectiveness of an evidence-based disaster awareness program specifically designed for nurses who work in the emergency department. This quality improvement project used David Kolb's Experiential Learning and the Kellogg Foundation's Logic as an organizational framework. goal, the educational intervention consisted of a variety of educational opportunities, including a self- study packet, an interactive poster, and group discussions.

Mahmoudi et al., (2017) conducted a study" The Effect of Nurses' Triage Training Based on Stabilization Model on the Patient's Waiting Time in Emergency Department". This study aimed to evaluate the effect of nurses' triage education based on stabilization model on the patient's waiting time in the emergency department of selected hospital. the result was**:** There was a significant difference between the mean waiting time before and after the intervention. In a way that the mean of first waiting time before the intervention was 15.34 minutes that reduced to 8.42 minutes after the intervention ($P<0.0001$). Moreover, the mean of second waiting time before the intervention was 14.58 minutes which decreased to 14.17 minutes after the intervention. However, the difference was not statistically significant ($P=0.82$). they concluded that: Nurses' triage training based on stabilization model reduces the patient's waiting time in the emergency department and in turn, accelerates service delivery. Therefore, we emphasize providing triage education to the emergency nurses.

Augustyn et al., (2009) conducted a study " Nurses and doctors' perceptions regarding the implementation of a triage system in an emergency unit in south Africa ". In this descriptive, quantitative and exploratory study, 15 nurses and doctors completed questionnaires. The challenges decreased and the sorting of patients improved after the implementation of the Cape Triage Score. Other strengths of this system included that the triage nurse prioritized patients, as opposed to the receptionist or the administrative staff; and nurses could undertake preliminary investigations without waiting for doctors' orders to do so. The weaknesses of the implemented Cape Triage Score included that it was not fully functional 100% of the time, and that it was diffi cult to maintain during peak admission periods due to a shortage of nurses. The recommendations included that management should be convinced of the system's benefits; nurses should perform the triage function on a rotation basis; more nurses should be available during peak periods; and that the administrative and reception staff should also be orientated about the triage system.

In USA **Heather et al., (2016)** conducted a study " An Emergency Triage Assessment and Treatment (ETAT)-based triage process in pediatric emergency department of a Guatemalan public hospital" that was a quality improvement comparison with a before/after design. Uptake was measured by percentage of patients with an assigned triage category, they concluded that: Pediatric-specific triage algorithms can be implemented and sustained in resource-limited settings. Significant decreases in admission rates (both overall and for the PICU) and trends towards decreased LOS and mortality rates of critically ill children suggest that ETAT-based triage systems have the potential to greatly improve patient care in USA.

In UK **Seiger et al., (2014)** conducted a study was " Improving the Manchester Triage System for Pediatric Emergency Care: An International Multicenter Study was aimed to examines the performance of the Manchester Triage System (MTS) after changing discriminators, and with the addition use of abnormal vital sign in patients presenting to pediatric emergency departments. At pediatric EDs of two hospitals in The Netherlands (2006–2009), one in Portugal (November–December 2010), and one in UK (June–November 2010), They concluded that: MTS 2 did not improve the performance of nurses at the MTS and with the MTS1 nurses performed slightly better than the original MTS. The use of vital signs (MTS 2) did not improve the performance of nurses at the MTS.

In Canada **Hategekimana et al., (2016)** conducted a study "Correlates of Performance of Healthcare Workers in Emergency, Triage, Assessment and Treatment plus Admission Care (ETAT+) Course in Rwanda , the aim of the study to evaluate the impact of the ETAT+ course on HCWs knowledge and practical skills, and to identify factors associated with greater improvement in knowledge and skills. They concluded that the study shows a positive impact of ETAT+ course on improving participants' knowledge and skills related to managing emergency pediatric and neonatal care conditions.

In Somaliland, **Sunyoto, et al., (2014)** conducted a cross – sectional study that " Providing emergency care and assessing a patient triage system in a referral hospital in Somaliland", This study aimed to describe the feasibility of managing an ED, including implementation of the SATS, in a district referral hospital in Somaliland during its first year of service. They concluded that: This is the first study assessing the implementation of SATS in a post-conflict and resource limited African setting showing that most indicators met the expected standards. In particular, specific attention is needed to improve the relatively low rate of true emergency cases, delays in patient presentation and in timely provision of care within the ED.

In South Africa, **Jacques et al., (2017)** conducted retrospective study that (The modified south African triage scale system for mortality prediction in resource constrained emergency surgical centers), The aim of the study was to verify if data from the south Africa triage system (SATS) combined with other easily available patient characteristics can facilitate the identification of patients at high risk of mortality. Such patients could then receive more focused supportive care during their inpatient stay. They concluded that SATS category, patient age, and reason for admission can be used to predict in-hospital mortality. This predictive model had good discriminative ability to identify ED patients at a high risk of death and performed better than the SATS alone.

Ray et al., (2017) conducted a study was (Clinician attitudes toward adoption of pediatric emergency telemedicine in rural hospitals). They examined attitudes regarding pediatric emergency telemedicine, including barriers to adoption in rural settings and potential strategies to overcome these barriers. The Results was: Factors influencing adoption of pediatric emergency telemedicine were identified and categorized into 3 domains: contextual factors (such as regional geography, hospital culture, and individual experience), perceived usefulness of pediatric emergency telemedicine, and perceived ease of use of pediatric emergency telemedicine. They concluded that: More effective adoption of pediatric emergency telemedicine among clinicians will require addressing perceived usefulness and perceived ease of use in the context of local factors. Future studies should examine the impact of specific identified strategies on adoption of pediatric emergency telemedicine and patient outcomes in rural settings.

Summary

A lot of international studies conducted about the level or evaluation of nurse's knowledge and perception regarding triage system and the barriers of triage implementation. In Gaza strip there is no any study about nurses' triage knowledge or perception and implementation, Also the triage system is unimplemented on Gaza pediatric hospitals, the MOH take into consideration to assess and solving it's to implement the triage system barriers at PED.

Chapter Three
Materials and Methods

This chapter explained the health systems research design and methods which included the study population and its eligibility criteria, sample size, sampling technique which used, the method of data collection, data analysis methods.

3.1 Study design

The design of this study is descriptive, analytical, cross-sectional design. The researcher Chooses to implement this design because it is the best design to describe the nurse's knowledge and perception. This type of study is useful to gather information on important health-related aspects of participants‟ knowledge at one a specific point of time. It is quick, cheap, easy to conduct, and it enables the researcher to meet the study objectives in a short time (Sedgwick, 2014).

3.2 Setting of the study

The study conducted in pediatric emergency departments in all governmental hospitals in the Gaza Strip (Bet-Hanon Hospital (BHH), Kamal-Edwan Hospital (KEH), Al-Dora Hospital (ADH), Al-Rantisi Hospital (ARH), Al-Nasser Pediatric Hospital (ANPH), Al-Aqsa Hospital (AQH), Nasser Medical Complex (NMC), and European Gaza Hospital (EGH)); all of these hospitals have 8 departments provide emergency care for children all over the Gaza Strip.

3.3 Study population

The population of the study consisted of all nurses currently working in the pediatric emergency departments at governmental hospitals in the Gaza Strip. Their total number is 120 nurses.

3.4 Study sampling and sample size

The sample of the study was the same as the population (census sample). In this study, 112 nurses agreed to participate in the study with response rate 93.3%. The study participants are from all the governmental hospitals that have pediatric emergency departments as presented below.

Table (3.1): Distribution of study participants according to hospital

Hospital name	N	%
Alnassr pediatric	18	16.0
Kamal Odwan	19	17.0
Al Rantisi	8	7.2
Al Aqsa	15	13.4
Nasser Medical Complex (NMC)	13	11.6
European Gaza Hospital (EGH)	10	8.9
Al Dorra	20	17.9
Bet Hanoon	9	8.0
Total	**112**	**100.0**

3.5 Instrument of the Study

Self-administered questionnaire was developed by the researcher to assess knowledge, Perception and triage implementation challenges of nurses regarding pediatric triage implementation. Based on conducted research literature; globally and locally. An expert panel team of researchers consulted to assess clarity and relevance of the newly developed questionnaire to the objectives of the study in term of content validity. The Questionnaire consist of four domains, the first domain for socio-demographic data for participants, the second domain for knowledge domain and their answer (Yes, No), the third and fourth domain for perception and challenges and their answers were Likert scale (Strongly Agee, Agree, Neutral, Disagree, Strongly Disagree).

3.6 Reliability and Validity

3.6.1 Validity

After constructing the questionnaire, it reviewed by experts, to judge face and content validity, and to get feedback and comments, the questionnaire evaluated by five arbitrators to assess the validity of the questionnaire, comments and modifications applied as needed. The filling of the questionnaires takes the same of recommended time.

3.6.2 Reliability

The reliability of the questionnaire tested immediately after data cleaning and pilot study and statistically by Cronbach Alpha test with accepted reliability coefficient not less than 0.7. The reliability improved by modification of the instrument and its implementation, design of self-administer questionnaire manual and data collection collected by the researcher himself and other data collectors.

Table (3.2): Reliabilities estimates for domains after pilot study

Domains	Items	Cronbach Alpha
Knowledge	11 items	0.83
Perception	11 items	0.75
Challenges	13 items	0.65

The reliability test was calculated for three domains (Knowledge, Perception, and Challenges) after finished the collection of data from all participants and analyzed by SPSS, it showed that Cronbach's Alpha equal 0.78 for the total questions.

3.7 Data Collection

The researcher ask the participant to fill full self-administered questionnaire; data was collected during unit visiting in different times during shifts (day, evening, night) in the period of study from "Dec 2018. – Oct. 2019".

3.8 Eligibility Criteria

3.8.1 Inclusion Criteria:

Nurses currently worked at pediatric emergency department at governmental hospitals

3.8.2 Exclusion Criteria:

1- Students were presented in emergency department during clinical training.

2- Participants who refuse to participate in the study.

3- Volunteer's nurses worked at pediatric emergency departments for more than 6 months.

3.9 Pilot Study

A pilot study conducted for 10 nurses, they filled the questionnaire before starting the whole data collection as a pre-test to point out weaknesses in wording, predicted response rate, determined the real time needed to fill the questionnaire and identified areas of vagueness and to test the reliability and suitability of the questionnaire. the questionnaire that used for piloting don't added to the sample of the study after modification occurs.

3.10 Statistical management and procedures

After checking and reviewing all filled questionnaires on the same way, data were entered in the computer using SPSS (Statistical Package for Social Science) software version 23 for data coding, entry, and analysis. After finishing the data entry process, check codes were used to avoid double entries. Pretesting of the tool were done to eliminate inconsistencies and made the questions relate to the local setting. Data cleaning were done to account for missing value in a bid to ensure integrity and reliability. Frequencies and cross tabs were used to do the data analysis. First, data cleaning was done to ensure that all

data entered accurately and in appropriate way. Data cleaning were conducted through selecting and checking out of a random number of the filled questionnaires, and also through operating frequencies and descriptive statistical test as Chi square. The level of significance was set at a *P* value of less than 0.05, confidence interval (CI) at 95%.

3.11 Ethical and administrative considerations

The researcher committed to all ethical consideration required to conduct a research. Ethical approval taken from Helsinki Committee in Gaza Governorates, MOH, in addition to approval from College of Health Professional at Al-Quds University was obtained by formal application. Every participant in the study receives a complete explanation of the research purposes, they informed about the optional participation in the study and confidentiality was given and maintained. The protection for the rights of the participants was a priority in this study and all the ethical consideration observed and respected for people and human rights and respect for truth.

3.12 Period of the study

The study was carried out during the period from December 2018 to December 2019.

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Chapter Four

Results and Discussion

This chapter presents the findings of statistical analysis of data. Description of participants' characteristics is illustrated. Results of different variables were identified, and the differences between selected variables were explored and discussed in relation to literature review and previous studies.

4.1 Socio-demographic characteristics of study participants

Table (4.1): Distribution of study participants by work conditions (n= 112)

Variable	**N**	**%**
Job title		
Practical nurse	37	33.0
Staff nurse	69	61.6
Nurse manager	6	5.4
Total	112	100.0
Working shifts		
Day shift	30	26.8
Evening-night shift	35	31.2
Day & evening night shift	47	42.0
Total	112	100.0
Have you received training about triage system?		
Yes	37	33.0
No	75	67.0
Total	112	100.0

As shown in table (4.1), 69 (61.6%) of study participants were staff nurses, 37 (33%) were practical nurses and 6 (5.4%) were nurse managers. Also, 47 (42%) of study participants work day & evening shift and 35 (31.2%) work evening-night shift. 33% of the nurses who participate on this study was attended to triage training course supervised by WHO, On the

other hand 67.0% of the nurses participate on this study wasn't attended on triage training course before. By compare with study (Afaya et al., 2017) Out of the sixty-five (65) participants, 37(56.9%) were males. Majority of the nurses 70.8% were of 21-30 years of age. In relation to the specialty areas of nurses, majority (87.7%) were registered general nurses with only 9.2% were emergency nurses. In relation to participants‟ education level, majority of the nurses 33(50.8%) were diploma degree holders.

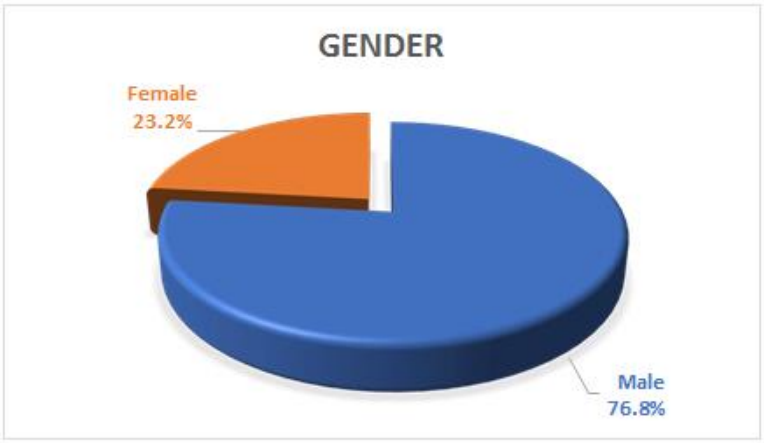

Figure (4.1): Distribution of study participants according to gender.

Figure (4.1) showed that 76.8% of study participants were male nurses, and 23.2% were females.

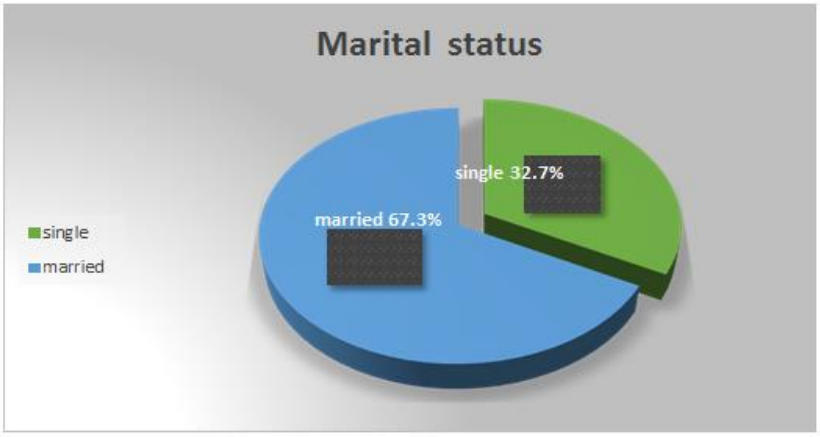

Figure (4.2): Distribution of study participants according to marital status

The participant was mainly married with 67.3%, the single was only 32.7% of the study sample.

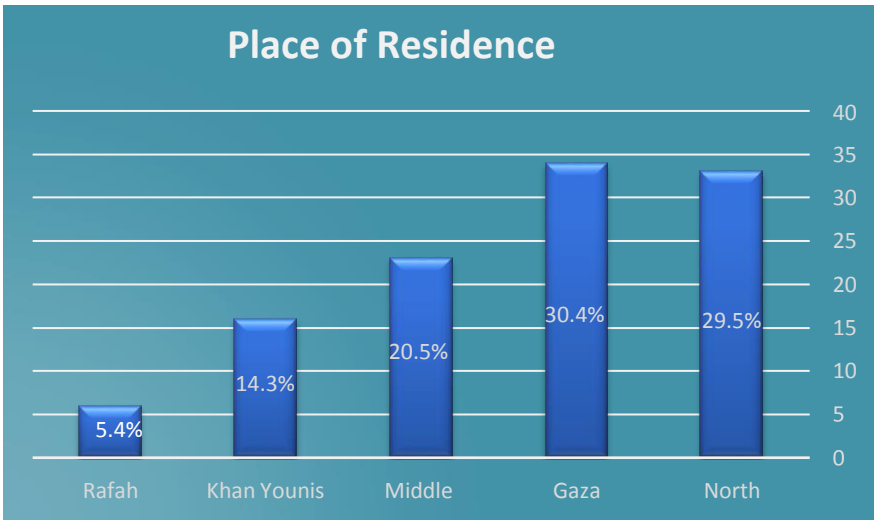

Figure (4.3): Distribution of study participants according to place of residence.

According to the place of residence 5.4% of the participant was from Rafah,14.3% of the participant was from khan Younis, 20.5% of the participant was from the middle area, also 30.4% of the participant was from Gaza and 29.5% of the participant was from the north.

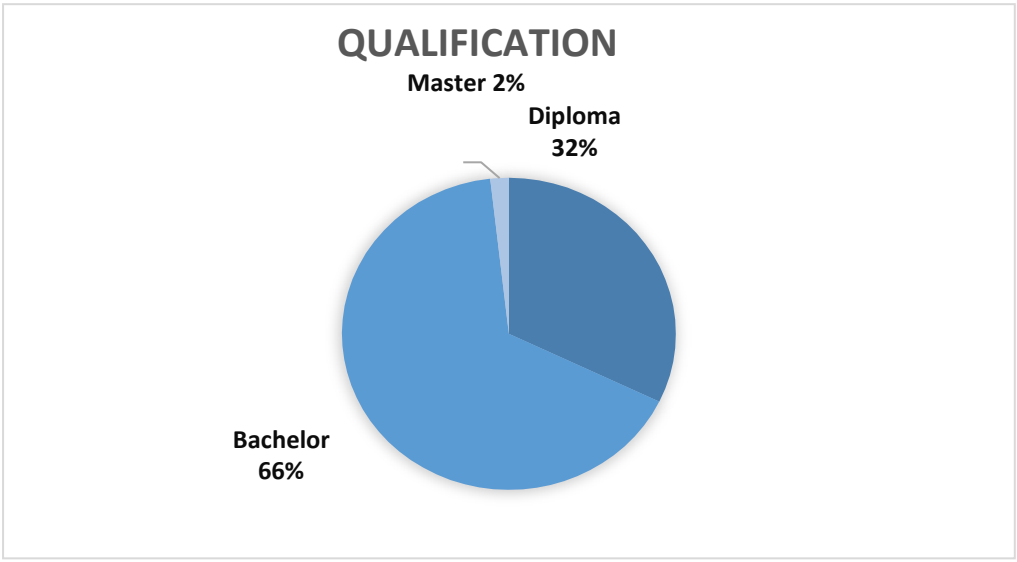

Figure (4.4): Distribution of study participants according to qualification

According to the qualification the nurses participate on this study was mainly bachelor degree in nursing with percent 66%, Diplom with nurses 32% and master nurses was 2%.

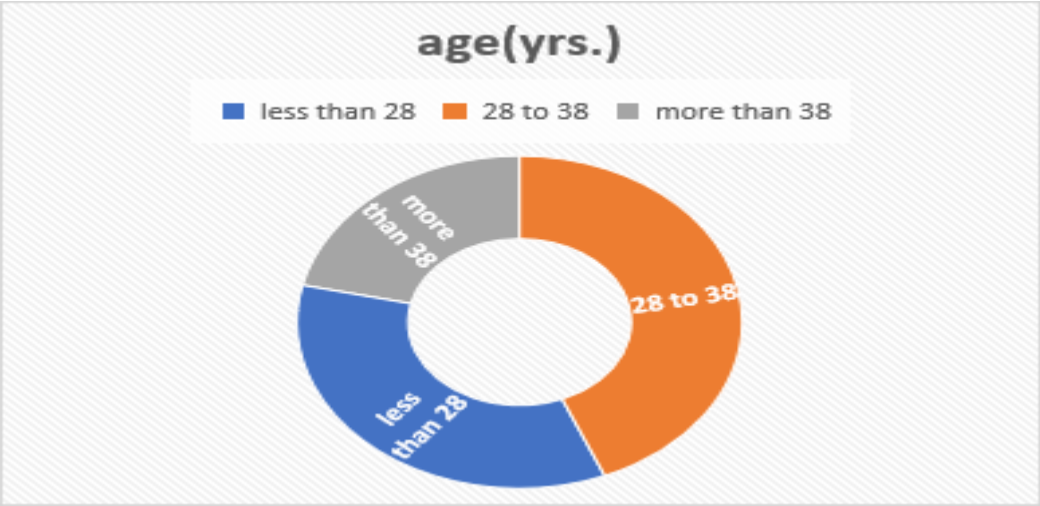

Figure (4.5): Distribution of study participants according to age

According to the age of the study sample most of them were from 28 – 38 years.

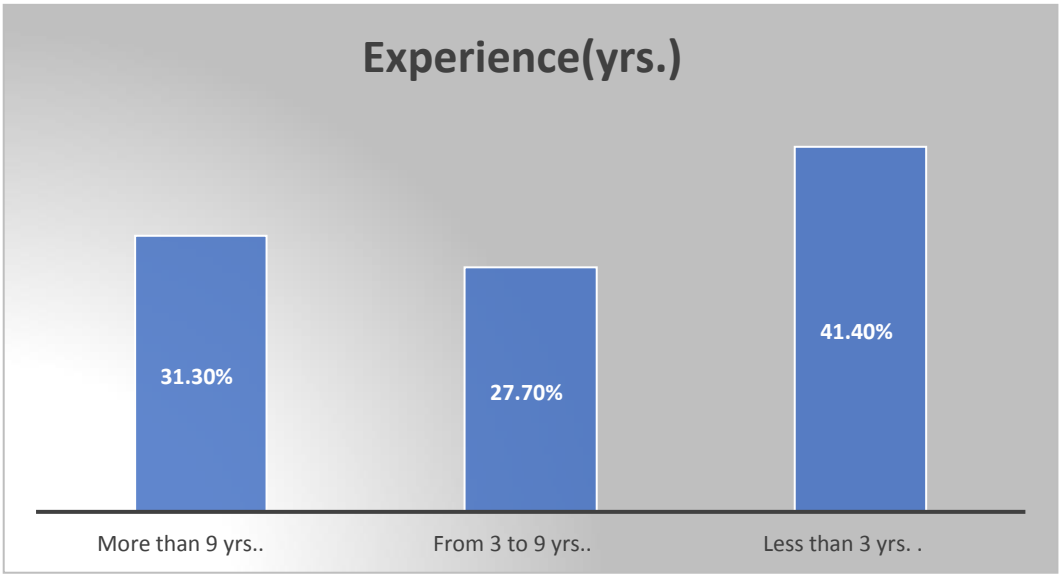

Figure (4.6): Distribution of study participants according to years of experience

Figure 4.6 demonstrate that most of the participant have an experience less than 3 year (41.4%) and then more than 9 year with percent (31.3%).

4.2 Knowledge about triage system

Table (4.2): Knowledge about triage system among study participants (n= 112)

No.	Item	Agree n (%)	Disagree n (%)	Mean	SD	Mean (%)	Rank
1	I received theoretical and practical lectures on the system of work of the triage in the ED	43(38.4)	69(61.6)	1.38	0.488	69.0	11
2	I have enough knowledge about how the triage system works in the ED	61(54.5)	51(45.5)	54.1	0.500	77.0	6
3	I have the ability to clearly explain how the triage system works for other colleagues	56(50.0)	56(50.0)	50.1	0.502	75.0	7
4	I can perform nursing tasks in the medical triage hall based on a thorough knowledge of the triage system	67(59.8)	45(40.0)	59.1	0.492	79.5	3
5	I can distinguish between the Triage system cards and the time value and priority of each	68(60.7)	44(39.3)	60.1	0.490	80.0	2
6	The Triage system is based on sorting cases with different color cards globally agreed upon	74(66.1)	38(33.9)	66.1	0.475	83.0	1
7	I have full knowledge of the possible waiting time for each color individually	44(39.3)	68(60.7)	39.1	0.490	69.5	10
8	The patient with the red card can wait up to an hour for medical care	67(59.8)	45(40.2)	59.1	0.492	79.5	3
9	A yellow card patient can wait up to three hours for medical care	64(57.1)	48(42.9)	57.1	0.497	78.5	5
10	The patient with the black card does not require medical care or intervention	50(44.6)	62(55.4)	44.1	0.499	72.0	8
11	The patient with the green card needs urgent and immediate medical intervention	50(44.6)	62(55.4)	44.1	0.499	72.0	8
Overall				1.52	0.190	76.0	

Table (4.2) shows the highest score obtained in knowing that the triage system is based on sorting cases with different color cards globally agreed upon with mean percent 83.0%, followed by ability to distinguish between the triage system cards and the time value and priority of each with mean percent 80.0%. The lowest score was in receiving theoretical

and practical lectures on the system of work of the triage in the ED with mean percent 69.0%, followed by having full knowledge of the possible waiting time for each color individually with mean percent 69.5%. The average of overall knowledge about triage system was 76.0%, which indicated above moderate knowledge. This result was higher than the results of Afaya et al. (2017) which revealed that 62.6% of the respondents were knowledgeable about triage system. Inconsistent result obtained in a study carried out by Allen et al. (2015) which showed that 69% of study participants had poor knowledge about triage system. In addition, the results of Fathoni (2013) found low level of knowledge about triage system among nurses working in the emergency centers. Moreover, the results obtained by Robert et al. (2014) found that 33% of the respondents were not knowledgeable about triage, 13% reported that although they had attended workshops, there had been a lack of information on how to triage patients, 52% of the respondents were not able to allocate the patient to the appropriate triage category. Furthermore, 58% had no knowledge on waiting time limits for the triaged categories. Another study carried out by Bereket et al. (2019) found that 51.5% of the study participants had low triage knowledge.

Moreover, a study conducted by Aghababaeian et al. (2017) found that the mean knowledge about triage among the study participants was average.

In the researcher opinion, adequate knowledge and high skills are needed to practice triage appropriately for the triage of patients. Therefore, there is a need for in-service training and education programs on a regular basis to maintain professional development and updated clinical skills.

4.3 Perception about triage system

Table (4.3): Perception about triage system among study participants (n= 112)

No	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Mean weight (%)	Rank
1	The Triage system affects the quality of healthcare in EDs significantly	0	1.8	1.8	38.4	58.0	4.52	0.629	90.4	1
2	Triage plays a major role in reaching patients and their families	0.9	5.4	17.0	46.4	30.4	4.00	0.880	80.0	9
3	The basis of the Triage system is based on the optimal utilization of capabilities and capabilities	0	3.6	13.4	50.9	32.1	4.11	0.768	82.2	8
4	The implementation of the Triage system needs huge supplies and efforts	2.7	33.0	10.7	33.0	20.5	3.35	1.214	67.0	10
5	Triage system is one of the foundations of patient safety in ED	0	3.6	8.9	42.9	44.6	4.28	0.776	85.6	6
6	The Triage system is an effective way of dealing with congestion in the ED	0	1.8	5.4	46.4	46.4	4.37	0.672	87.4	3
7	I believe in the importance of the role of the nurse in the application of the Triage system in the ED	0.9	0.9	4.5	49.1	44.6	4.35	0.695	87.0	5
8	Nursing and medical staff can control the overcrowding of cases in the emergency department without activating the triage system	7.1	41.1	19.6	18.8	13.4	2.90	1.192	58.0	11
9	I believe in the key role of the Triage system in providing emergency health care in the pediatric ED as a priority	0	5.4	13.4	42.9	38.4	4.14	0.847	82.8	7
10	I would like to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED	0	2.7	7.1	36.6	53.6	4.41	0.741	88.2	2
11	We are convinced of the need to activate the Triage system in the management of cases at ED overcrowding	0	3.6	8.9	34.8	52.7	4.36	0.794	87.2	4
Overall							4.07	0.396	81.4	

Table (4.3) showed that the highest score obtained in perceiving that the triage system affects the quality of healthcare in EDs significantly with mean percent 90.4%, followed by "I would like to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED with mean percent 88.2%. The

lowest score obtained in “nursing and medical staff can control the overcrowding of cases in the emergency department without activating the triage system: with mean percent 58%, followed by “the implementation of the Triage system needs huge supplies and efforts” with mean percent 67%. The average overall perception was 81.4%, which indicated high perception about triage system. This result was nearly consistent with Akinaga et al. (2017) which showed that most students were likely to answer the triage questions largely based on their perception of visual information (such as video images) rather than on triage criteria. In addition, the study of Afaya, et al. (2017) revealed that the majority of nurses (96%) in the ED of the various hospitals had a very good perception about the importance of triage to the patient, care provider and the country at large. Another study carried out by Bereket, et al. (2019) found that 76.2% of participants perceived their overall triage skill to be at good level. A study carried out in Egypt found that the median attitude score towards emergency cases was 82.3% for physicians and 81.9% for nurses. Most physicians (94.1%) and nurses (85.0%) had practiced emergency care in the primary health care. More physicians as compared to nurses (58.8% versus 50.7%) reported greatest need for continuing medical education in the management of pediatric emergencies. More than half of physicians endorsed hospital training (58.8%) while 48.4% endorsed practical training in PHC settings (Mohey, 2017).

The researcher believes that appositive perception about triage is an important factor that will enhance the triage system, and motivate the triage staff to categorize the patients correctly according to their condition and seriousness of their illness when they present to the ED.

4.4 Challenges to triage implementation

Table (4.4): Challenges to triage system (n= 112)

No	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Mean weight (%)	Rank
1	I think that there are major challenges and obstacles that will face the implementation of the triage system at pediatric emergency department	1.8	31.3	9.8	33.9	23.2	3.45	1.207	69.0	3
2	The working environment is suitable and suitable for the possibility of the triage system implementation	5.4	42.0	18.8	28.6	5.4	2.86	1.061	57.2	7
3	The decision-makers motivated to implement the triage system	3.6	29.5	17.0	40.2	9.8	3.23	1.090	64.6	5
4	The nursing staff currently in my department is sufficient to implement the triage system	16.1	48.2	15.2	13.4	7.1	2.47	1.130	49.4	8
5	The nursing staff has the real motivation to apply the triage system	5.4	14.3	9.8	35.7	34.8	3.80	1.214	76.0	2
6	Cases overcrowding is one of the obstacles to the implementation of the triage system	5.4	29.5	17.9	26.8	20.5	3.27	1.239	65.4	4
7	I think the public has enough idea about how the triage system works	19.6	54.5	15.2	6.3	4.5	2.21	0.981	44.2	
8	There is a really desire among the public to implement the triage system	14.3	55.4	17.0	10.7	2.7	2.32	0.941	46.4	9
9	The department has material resources that allow the triage system to be easily implemented	17.0	58.9	8.0	16.1	0	2.23	0.920	44.6	11
10	Human security controls are available that can control any mess in the triage hall and contribute to the time limitations of the triage system	19.6	58.0	8.0	10.7	3.6	2.20	0.996	44.0	13
11	Triage room contain adjustment banners that guide people and help to understand triage working method	23.2	52.7	7.1	10.7	6.3	2.24	1.116	44.8	10
12	There is a sufficient time for nurses to implement triage at pediatric emergency	14.3	33.9	14.3	15.2	22.3	2.97	1.404	59.4	6
13	Work load at pediatric emergency impedes triage implementation	5.4	15.2	6.3	33.9	39.3	3.86	1.241	77.2	1
Overall								2.85	0.388	57.0

Table (4.4) shows that the highest score obtained in the challenge that work load at pediatric emergency impedes triage implementation with mean percent 77.2%, followed by the nursing staff has the real motivation to apply the triage system with mean percent 76%. The lowest score was in "human security controls are available that can control any mess in the triage hall and contribute to the time limitations of the triage system" with mean percent 44%, followed by "I think the public has enough idea about how the triage system works: with mean percent 44.2%. The average overall challenges were 57%, which indicated moderate level of challenges to implement triage system in pediatric emergency departments. The study of Augustyn (2009) showed that the most prominent challenges prior to the implementation of the Cape Triage Score were the patients' complaints about their long waiting times (86.6%) and the time taken for doctors to see patients (80.0%). In addition, 53.3% (n=8) of the respondents indicated that receptionists and administrative staff incorrectly prioritized patients. Several challenges influence the implementation of triage system in EDs. The challenges include availability of written clinical practice guidelines for providing emergency services, guidelines for pediatric emergency triage, assessment or treatment and referral guidelines, and lack of some essential equipment and drugs (Mohey, 2017).

In the researcher opinion, the triage system is a big challenge in Gaza Strip. It is a new concept that can be implementing in governmental hospitals with support from the International Committee of Red Cross – Gaza office. To run triage properly, the structure of ED should be arranged well with availability of security personnel to avoid overcrowd by escorts. In addition, the staff (including nurses and doctors) who are working in EDs should be trained on triage system, performing good assessment, and categorize patients accurately according to the severity of their illness.

4.4 Relationship between knowledge, perception, and challenges

Table (4.5): Relationship between knowledge, perception, and challenges to triage implementation

Variable		Knowledge	Perception	Challenges
Knowledge	Correlation	1		
	P value			
Perception	Correlation	0.045	1	
	P value	0.639		
Challenges	Correlation	0.096	-0.201-*	1
	P value	0.315	0.034	

Pearson correlation test *Correlation is significant at the 0.05 level (2-tailed).

Table (4.5) showed that there was statistically significant negative relationship between perception about triage system and challenges to implement triage system (r= -0.201, P= 0.034), which means that as triage system challenges decrease, perception will increase. In addition, there were statistically no significant relationship between knowledge and perception (P= 0.639), and knowledge and challenges (P= 0.315).

In the researcher opinion, having positive perception about triage is an essential factor for the success of any triage system. If the nurse or physician have a positive perception, that will decrease the barriers and challenges that hinder the implementation of the triage system. In addition, employing adequate qualified staff is another challenge that will make the difference for the appropriate implementation of triage system.

4.5 Relationship between knowledge, perception, challenges, and sociodemographic characteristics

Table (4.6): Relationship between knowledge, perception, challenges and gender (n= 112)

Variable	Gender	N	Mean	SD	T value	P value
Knowledge	Male	86	1.524	0.194	0.159	0.874
	Female	26	1.517	0.181		
Perception	Male	86	4.087	0.385	0.553	0.581
	Female	26	4.038	0.438		
Challenges	Male	86	2.862	0.401	0.185	0.854
	Female	26	2.846	0.348		

Independent sample (t) test

Table (4.6) showed that there were statistically no significant differences in knowledge about triage system (P= 0.874), perception about triage system (P= 0581), and challenges to implementing triage system (P= 0.854) related to gender.

Healthcare inefficiency and error can result from implicit social factors associated with the health provider's characteristics themselves. The results obtained by Vigil et al., (2017) found that assessment of nurse's knowledge did not differ by nurse's gender; however higher levels were associated with higher priority emergency severity index.

This result is logic as nurses who are working in ED, regardless of their gender have similar knowledge and perception about triage system as they are working in the same place with similar environment and policies.

Table (4.7): Relationship between knowledge, perception, challenges and age (n= 112)

Variable		n	Mean	SD	F	P value
Knowledge	Less than 28 years	39	1.575	0.159	4.766	0.010*
	28 – 38 years	49	1.462	0.194		
	39 and more	24	1.560	0.201		
	Total	112	1.522	0.190		
Perception	Less than 28 years	39	4.081	0.393	0.821	0.443
	28 – 38 years	49	4.115	0.382		
	39 and more	24	3.988	0.431		
	Total	112	4.076	0.396		
Challenges	Less than 28 years	39	2.948	0.418	1.700	0.187
	28 – 38 years	49	2.799	0.385		
	39 and more	24	2.833	0.324		
	Total	112	2.858	0.388		

*Significant at 0.05 One-way ANOVA test

Table (4.7) showed that there were statistically significant differences at 0.05 in knowledge about triage system related to age (F= 4.766, P= 0.010). Post hoc LSD indicated that participants from the age group 28 – 38 years had the lowest level of knowledge compared to their counter parts from other age groups. In addition, the results showed that there were statistically no significant differences in perception and challenges to implementing triage system related to age of participants.

When running ANOVA test and get a significant result, that means at least one of the groups tested differs from the other groups. However, the ANOVA test will not tell which group differs. In order to determine the direction of the differences, we use post hoc multi-comparison test. The least significant difference (LSD) calculates the smallest significant differences between two means as if a test had been run on those two means.

Table (4.8): Relationship between knowledge, perception, challenges and marital status (n= 112)

Variable	Marital status	n	Mean	SD	T value	P value
Knowledge	Single	32	1.571	0.177	1.709	0.090
	Married	80	1.503	0.193		
Perception	Single	32	4.028	0.398	-0.807	0.421
	Married	80	4.095	0.396		
Challenges	Single	32	2.983	0.383	2.186	0.031*
	Married	80	2.808	0.380		

*Significant at 0.05 Independent sample (t) test

Table (4.8) showed that there were statistically significant differences at 0.05 in challenges to implement triage system related to marital status (P= 0.031), which means that participants who are single reported higher challenges to implement triage system compared to married participants. In addition, there were statistically no significant differences in knowledge (P= 0.090) and perception (P= 0.421) toward triage system related to marital status.

In the researcher opinion, nurses who are working in ED, either single or married, are working in the same place, with the same conditions, same work environment, and same policies, so, they will have similar knowledge and perception about triage. Other factors may cause differences in knowledge and perception such as work experience, qualification, and previous training on triage.

Table (4.9): Relationship between knowledge, perception, challenges and place of residency (n= 112)

Variable		n	Mean	SD	F	P value
Knowledge	North	33	1.427	0.207	5.560	0.000*
	Gaza	34	1.502	0.173		
	Middle	23	1.581	0.146		
	Khanyounis	16	1.619	0.176		
	Rafah	6	1.681	0.076		
	Total	112	1.522	0.190		
Perception	North	33	4.140	0.422	2.423	0.053
	Gaza	34	4.128	0.406		
	Middle	23	3.972	0.378		
	Khanyounis	16	3.886	0.295		
	Rafah	6	4.333	0.279		
	Total	112	4.076	0.396		
Challenges	North	33	2.724	0.324	5.992	0.000*
	Gaza	34	2.778	0.378		
	Middle	23	2.862	0.351		
	Khanyounis	16	3.182	0.373		
	Rafah	6	3.166	0.387		
	Total	112	2.858	0.388		

*Significant at 0.05 One-way ANOVA test

Table (4.9) showed that there were statistically significant differences in knowledge about triage system related to place of residency (F= 5.560, P= 0.000). Post hoc LSD indicated that participants from the North and from Gaza had significant lower knowledge about triage system compared to participants from Khanyounis and Rafah. The results also showed that there were statistically significant differences at 0.05 in challenges to implement triage system related to place of residency (F= 5.992, P= 0.000). Post hoc LSD indicated that participants from Khanyounis and Rafah reported higher challenges to implement triage system compared to participants from North, Gaza, and middle governorate. Furthermore, the results did not show significant differences in perception about triage system related to place of residency.

Table (4.10): Relationship between knowledge, perception, challenges and qualification (n= 112)

Variable	Educational level	n	Mean	SD	T value	P value
Knowledge	Diploma	36	1.462	0.188	-2.361	0.020*
	Bachelor	76	1.551	0.186		
Perception	Diploma	36	4.060	0.403	-0.287	0.775
	Bachelor	76	4.083	0.396		
Challenges	Diploma	36	2.841	0.488	-0.311	0.756
	Bachelor	76	2.866	0.333		

*Significant at 0.05 Independent sample (t) test

Table (4.10) showed that there were statistically significant differences at 0.05 in knowledge about triage system related to qualification (P= 0.020), and participants who have bachelor degree expressed higher knowledge compared to those who have diploma certificate. In general, the results showed statistically no significant differences in perception and challenges to implement triage related to qualification of participants. Inconsistent results obtained by Küçükoğlu et al. (2017) who found statistically significant differences in triage practices related to level of education. They also found that 72.7% of the nurses did not consider themselves qualified to perform triage, and 68.2% believed that triage was among the duties of emergency care nurses. It was also determined that the physical environment of the emergency department, the ability of personnel to triage and the absence of specialist physicians and nurses were factors affecting triage practice. Another study carried out by Bereket, et al. (2019) found that educational level of study participant is a significant factor associated with triage knowledge and skill.

Table (4.11): Relationship between knowledge, perception, challenges and job title (n= 112)

Variable		n	Mean	SD	F	P value
Knowledge	Practical nurse	37	1.476	0.195	5.497	0.005*
	Staff nurse	69	1.528	0.182		
	Nurse manager	6	1.742	0.068		
	Total	112	1.522	0.190		
Perception	Practical nurse	37	4.073	0.395	0.113	0.894
	Staff nurse	69	4.071	0.402		
	Nurse manager	6	4.151	0.392		
	Total	112	4.076	0.396		
Challenges	Practical nurse	37	2.835	0.478	0.105	0.900
	Staff nurse	69	2.871	0.340		
	Nurse manager	6	2.846	0.337		
	Total	112	2.858	0.388		

*Significant at 0.05 One-way ANOVA

Table (4.11) showed that there were statistically significant differences at 0.05 in knowledge about triage system related to job title (F= 5.497, P= 0.005). Post hoc LSD indicated that nurse managers have significant higher knowledge compared to participants with diploma and bachelor degree. In addition, the results showed no statistically significant differences in perception and challenges to implement triage system.

Table (4.12): Relationship between knowledge, perception, challenges and experience in pediatric ED (n= 112)

Variable		N	Mean	SD	F	P value
Knowledge	Less than 3 years	46	1.523	0.184	1.366	0.259
	3 – 9 years	31	1.480	0.188		
	More than 9 years	35	1.558	0.199		
	Total	112	1.522	0.190		
Perception	Less than 3 years	46	4.055	0.383	0.121	0.886
	3 – 9 years	31	4.099	0.424		
	More than 9 years	35	4.083	0.398		
	Total	112	4.076	0.396		
Challenges	Less than 3 years	46	2.899	0.372	0.595	0.554
	3 – 9 years	31	2.858	0.345		
	More than 9 years	35	2.804	0.443		
	Total	112	2.858	0.388		

One-way ANOVA

Table (4.12) showed that there were statistically no significant differences in knowledge about triage system (P= 0.259), perception about triage system (P= 0.886), and challenges to implement triage system (P= 0.554) related to years of experience in pediatric ED.

This result was inconsistent with the results of Afaya et al. (2017) which indicated that nurses who worked for a year or less scored below average knowledge about triage. Moreover, nurses who worked for two years had scores slightly above average, and nurses who had three years and four or more years working experience had higher level of knowledge (74% and 80% respectively). In addition, Fathoni (2013) found that working experience was correlated with triage skills and knowledge particularly for those who continued working at ED for more than five years, and those nurses with emergency experience had more abilities in triage skill than nurses with less years of working

experience. Another study carried out by Bereket, et al. (2019) found that working experience of study participants and triage experience were factors associated with triage knowledge and skills.

Table (4.13): Relationship between knowledge, perception, challenges and work shifts (n= 112)

Variable		n	Mean	SD	F	P value
Knowledge	Day shift only	30	1.578	0.184	2.713	0.071
	Evening-night	35	1.470	0.196		
	Day, evening & night	47	1.526	0.183		
	Total	112	1.522	0.190		
Perception	Day shift only	30	4.021	0.428	0.397	0.673
	Evening-night	35	4.090	0.354		
	Day, evening & night	47	4.100	0.409		
	Total	112	4.076	0.396		
Challenges	Day shift only	30	2.848	0.399	0.030	0.970
	Evening-night	35	2.852	0.398		
	Day, evening & night	47	2.869	0.381		
	Total	112	2.858	0.388		

One way ANOVA

Table (4.13) showed that there were no statistical significant differences in knowledge about triage system (P= 0.071), perception about triage system (P= 0.673), and challenges to implement triage system (P= 0.97) related to working shifts.

In the researcher opinion, nurses who are working in ED usually working in rotating shifts of morning, evening, and night shifts, therefore, they should have similar knowledge and perceptions because they are the same nurses who are working in different shifts. It is obvious that the nurse who is working morning shift this week and working night shift next week will not change his knowledge and perception about Triage. Therefore, this result was logic as no significant differences in knowledge and perception related to working shift at ED.

Table (4.14): Relationship between knowledge, perception, challenges and hospital

(n= 112)

Variable		N	Mean	SD	F	P value
Knowledge	Al Nassr Ped.	18	1.494	0.207	3.464	0.002*
	Kamal Odwan	19	1.449	0.213		
	Al Rantisi	8	1.465	0.156		
	Al Aqsa	15	1.636	0.128		
	NMC	13	1.587	0.184		
	EGH	10	1.654	0.127		
	Al Dorra	20	1.513	0.159		
	Bet Hanoon	9	1.373	0.189		
	Total	112	1.522	0.190		
Perception	Al Nassr Ped.	18	3.888	0.416	2.725	0.012*
	Kamal Odwan	19	4.043	0.374		
	Al Rantisi	8	4.397	0.572		
	Al Aqsa	15	4.012	0.312		
	NMC	13	3.909	0.287		
	EGH	10	4.072	0.451		
	Al Dorra	20	4.268	0.308		
	Bet Hanoon	9	4.161	0.351		
	Total	112	4.076	0.396		
Challenges	Al Nassr Ped.	18	2.948	0.379	3.351	0.003*
	Kamal Odwan	19	2.696	0.300		
	Al Rantisi	8	2.721	0.232		
	Al Aqsa	15	2.912	0.364		
	NMC	13	3.171	0.348		
	EGH	10	3.038	0.421		
	Al Dorra	20	2.688	0.458		
	Bet Hanoon	9	2.777	0.186		
	Total	112	2.858	0.388		

*Significant at 0.05 One way ANOVA

Table (4.14) showed that there were statistically significant differences at 0.05 in knowledge about triage system related to hospital (F= 3.464, P= 0.002). Post hoc LSD indicated that participants from EGH had significant higher knowledge about triage system compared to participants from other hospitals. In addition, there were statistically significant differences in perception related to hospital (P= 0.012). Post hoc LSD indicated that participants from Al Rantisi hospital had significant higher perception about triage system compared to participants from other hospitals. Moreover, there were statistically significant differences in challenges to implement triage (P= 0.003). Post hoc LSD indicated that participants from NMC reported higher challenges to implement triage system. This result agreed with a study conducted by Haghigh et al. (2017) which showed different levels of knowledge about triage among nurses from different areas, and that 51.4% of nurses had low level of knowledge and 44.3% had a moderate level of knowledge about triage.

Triage system started at EGH three years ago in cooperation between the MoH and the International Committee of Red Cross. The ED at EGH was reconstructed and designed to make triage for all the patients who comes to the ED. At the same time, the nurses received special training about triage system by the Red Cross team, therefore, they expressed higher knowledge about triage compared to other hospitals.

In addition, triage system started at Nasser hospital last year after opening the new ED. Several challenges face the nurses who are working in ED at Nasser hospital including inadequate qualified nurses to work as triage nurse, small area designed as triage area, inadequate cooperation between nurses and physicians, and unavailability of security personnel all the time. Extra efforts are needed by hospital administration in order to overcome these challenges and make the triage system functioning well for the benefits of patients who seek emergency treatment at Nasser hospital ED.

Table (4.15): Relationship between knowledge, perception, challenges and previous triage training

Variable	Received training about triage	N	Mean	SD	T value	P value
Knowledge	Yes	37	1.624	0.172	4.239	0.000*
	No	75	1.472	0.179		
Perception	Yes	37	4.113	0.354	0.687	0.494
	No	75	4.058	0.416		
Challenges	Yes	37	2.943	0.384	1.647	0.102
	No	75	2.816	0.385		

*Significant at 0.05 independent sample (t) test

Table (4.15) showed that there were statistically significant differences at 0.05 in knowledge about triage system related to training (P= 0.000), which means that participants who received training about triage system had significant higher knowledge compared to their counterparts who did not receive training. In addition, there were statistically no significant differences in perception and challenges to implement triage between participants who received training and who did not receive training about triage system. In this regard, Kelly (2010) reported that specialty education and continuing training in triage contribute considerably to the correct triage decisions that are essential for good health outcomes and that continuing training but not experience was found to influence triage decision-making. Therefore, prior to adopting a triage role, nurses should have both adequate specialized training and experience in the triage system. Karen Hammad et al. (2017) conducted a study in China found that 50.8% of participants reported receiving dedicated triage training, which was provided by their employer (38.6%), an education organization (30.7%) or at a conference (26.1%). Another study carried out by Pouraghaei et al. (2015) found that providing training program about triage was effective in improving the knowledge and practice of employees and decreased error in performance. Another study conducted by Haghigh et al. (2017) found that 51.4% of study participants

had low level of knowledge about triage and 44.3% had a moderate level of knowledge about triage. Furthermore, Hussein et al. (2019) found that there were highly significant differences in knowledge and skills after implementing an educational program about triage system in emergency department. In addition, Abdoos, et al. (2016) found that the frequency of correct triage by trained group was significantly higher than by the untrained group (80% vs. 30%). Another study conducted by Hategekimana et al. (2016) evaluated the impact of a training course on knowledge and practical skills. The results showed a positive impact of the training course on improving participants' knowledge and skills related to managing emergency pediatric and neonatal care conditions.

In the researcher opinion, training is important for nurses to gain knowledge and experience and keep updated with new development in the nursing field. Triage is a new system started gradually in EDs at governmental hospitals in GS, so, it is essential to give the nurses adequate knowledge and skills before working as a triage nurse, so they can perform their tasks properly and with quality.

Chapter Five
Conclusion and Recommendations

5.1 Conclusion

The study results revealed that the socio-demographic data weren't determinant factors affecting nurse's knowledge, perception, and triage challenges regarding pediatric triage implementation. The level of knowledge, perception for nurses regarding triage implementation are corresponding with different studies about triage. The study findings revealed that nurse's knowledge level about triage in the EDs of various pediatric government hospitals in Gaza strip were average score (76%). As nurse's knowledge about triage is a key tool in triage decision making, there is the need to improve on nurse's knowledge level and skills in triaging at the PED, To improve the knowledge level, workshops/in-service training should be carried out, followed by continuous professional development on a regular basis for nurses in the PEDs. Nurses in the PEDs of the various hospitals should be encouraged to undergo training in emergency, critical care and trauma nursing, as this will go further to enhance their knowledge on triage which will further improve the quality of care at PEDs

5.2 Recommendations:

1- The findings of this study could serve as guidelines for research prior to the future implementation of the same or similar triage systems in other emergency units.
2- Nurses can be trained specifically to perform triage functions and should perform these functions on a rotating basis. Regular in-service education sessions include theoretical and practical lectures on the system of work of the triage in the emergency department include knowledge of the possible waiting time for each color individually
3- The need for additional nurses during peak periods should be investigated, quantified

and addressed in the most cost-effective manner possible. For example, specific nurses and doctors could be 'on-call' from 16:00 until 24:00 pm, to assist if the workflow increases beyond the capacity of the available nurses and doctors during peak hours.

4- Shortage of human security controls can be considered because them effect that can control any mess in the triage hall and contribute to the time limitations of the Triage system

5- Regular assessments can be done of the time that patients have to wait before being attended to in the emergency unit to quantify slandered appropriate waiting time.

6- The financial cost of maintaining a triage system, such as the need for an additional registered nurse, quantify and weight against aspects of improved patient care, such as reduced waiting times, increased patient security, reduced morbidity and mortality figures, and increased levels of staff members' job satisfaction.

7- Nurses and doctors can be encouraged to attend training sessions in implementing the pediatric triage and to visit other hospitals where this system has been implemented. Staff members could each visit a different center and provide feedback to the entire group of doctors and nurses working in this unit. Based on the identified strengths and weaknesses of the visited centers, best practice guidelines for this unit should be compiled and tested.

8- Nurses performing triage functions can be requested to keep a diary of challenges encountered and suggestions for addressing these challenges in future. Regular focus group discussions about nurses' triage experiences should be conducted.

9- Receptionists and administrative staff members scan also be orientated about the triage process. Future studies should conduct two investigations, before and after the implementation of the PED triage, in a specific unit. This will produce comparative data and enable the calculation of correlation statistics.

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Annexes

Annex 1: Questionnaire in Arabic

معرفة وأدراك الممرضين فيما يتعلق بتنفيذ نظام الفرز (التریاج) في أقسام طوارئ الأطفال في قطاع غزة

Nurses Knowledge and Perception Regarding the Implementation of Triage System in Pediatric Emergency Department at Gaza Strip

الإخوة والأخوات الأفاضل.....

السلام عليكم ورحمة الله وبركاته:

هذا البحث متطلب لنيل درجة الماجستير في تمريض الأطفال من جامعة القدس – أبو ديس كلية الدراسات العليا وهذا البحث ممول ذاتيا من الباحث حيث تهدف هذه الدراسة إلى تقييم معرفة وإدراك الممرضين فيما يتعلق بتطبيق نظام الفرز الصحي في أقسام طوارئ الأطفال في قطاع غزة.

لذا نرجو منكم التكرم بالإجابة عن جميع أسئلة الاستبانة، فرأيكم يمثل أهمية كبيرة بالنسبة لهذه الدراسة علما بأن إجابتكم ستستخدم لأغراض البحث العلمي فقط مع ضمان السرية التامة.

الوقت الذي تستغرقه تعبئة الاستبانة لا يتجاوز 15 دقيقة، وفي حال الاستفسار عن أي أسئلة يرجى التواصل على جوال رقم 0595235481/

وشكراً لحسن تعاونكم

الباحث

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Research Title

Nurses' Knowledge and Perception Regarding the Implementation of Triage System at Pediatric Emergency Department in Gaza Strip

General Goal

The aim of this study is to assess nurse's knowledge and perception regarding the implementation of triage system in pediatric emergency department at Gaza Strip.

Specific objectives

1- To determine the nurses' knowledge about the triage of patients.

2- To identify the nurses' perception about triage system.

3- To identify the challenges for implementation of pediatric triage system

4- To Investigate the relationship between nurse's knowledge level and their perception about triage implementation.

5- To investigate the relationship between nurse's knowledge and their qualification

6- To identify the relationship between nurse's knowledge and their site of work

7- To observe the relationship between nurse's knowledge and their sociodemographic characteristics

8- To investigate the relationship between nurse's perception and their sociodemographic characteristics

9- To investigate the relationship between nurse's perception and their qualification

10- To suggest recommendations for the further improvement of the newly implemented triage system.

المحور الأول: مستوى المعرفة		نعم	لا
.1	تلقيت محاضرات نظرية وعملية حول نظام عمل انظام التريا ج في قسم الطوارئ		
.2	أملك المعرفة الكافية حول ألية عمل نظام التريا ج في قسم الطوارئ		
.3	لدي المقدرة على شرح ألية عمل نظام الفرز للزملاء الأخرين بوضوح		
.4	أستطيع القيام بالمهام التمريضية في صالة الفرز الطبي على أساس معرفة تامة بنظام التريا ج		
.5	أستطيع التمييز بين بطاقات نظام التريا ج والقيمة الزمنية والأولوية لكل منها		
.6	يعتمد نظام التريا ج على فرز الحالات ببطاقات ذات ألوان مختلفة متفق عليها عالميا		
.7	لدي معرفة تامة بالقيمة الزمنية للانتظار الممكنة لكل لون على حدة		
.8	المريض صاحب البطاقة الحمراء يمكن أن ينتظر لغاية ساعة لتلقى الرعاية الطبية		
.9	المريض صاحب البطاقة الصفراء يمكن أن ينتظر لغاية ثلاث ساعات لتلقي الرعاية الطبية		
.10	المريض صاحب البطاقة السوداء لا يحتاج رعاية أو تدخل طبي		
.11	المريض صاحب البطاقة الخضراء يحتاج تدخل طبي عاجل وفوري		

المحور الثاني: مستوى التصور		موافق بشدة	موافق	محايد	غير موافق	غير موافق بشدة
.12	يؤثر نظام التريا ج على جودة الرعاية الصحية في أقسام الطوارئ بشكل كبير					
.13	يلعب التريا ج دور كبير في الوصول لرضى المرضى وعائلاتهم					
.14	يقوم أساس نظام التريا ج على الاستغلال الأمثل للإمكانيات والقدرات					
.15	يتطلب تطبيق نظام التريا ج إمكانيات ومجهودات ضخمة وكبيرة					
.16	يعتبر نظام التريا ج من أسس سلامة المرضى في أقسام الطوارئ					
.17	يعتبر نظام التريا ج أسلوبا ناجعا في التعامل مع ازدحام الحالات في قسم الطوارئ					
.18	أؤمن بأهمية دور الممرض في تطبيق نظام التريا ج في قسم الطوارئ					
.19	يستطيع الطاقم التمريضي والطبي بالسيطرة على تزاحم الحالات في قسم الطوارئ بدون تفعيل نظام التريا ج					
.20	أؤمن بالدور الرئيسي لنظام التريا ج في تقديم الرعاية الصحية الطارئة في أقسام استقبال الأطفال حسب الأولوية					
.21	أمتلك الرغبة للمشاركة في دورات ومؤتمرات وأنشطة علمية تعزز أهمية تطبيق نظام التريا ج في أقسام الطوارئ					
.22	أنا على قناعة بضرورة تفعيل نظام التريا ج في إدارة حالات الازدحام المرضية في قسم استقبال الأطفال					

	المحور الثالث: التحديات والمعيقات	موافق بشدة	موافق	محايد	غير موافق	غير موافق بشدة
.23	أعتقد أن هناك تحديات ومعيقات كبيرة ستواجه تفعيل نظام الترياج في قسم استقبال الأطفال					
.24	بيئة العمل مناسبة وملائمة لإمكانية تفعيل نظام الترياج					
.25	أؤمن بوجود قناعة ورغبة لدى أصحاب القرار بتفعيل نظام الترياج					
.26	الكادر التمريضي المتواجد حاليا في قسمي يكفي لتطبيق نظام الترياج					
.27	الكادر التمريضي لديه الدافع الحقيقي لتطبيق نظام الترياج					
.28	ازدحام الحالات يعتبر أحد معيقات تطبيق نظام الترياج					
.29	أعتقد بأن الجمهور لديه فكرة كافية حول الية عمل نظام الترياج					
.30	هناك رغبة حقيقة لدى الجمهور تدعو لتفعيل نظام الترياج					
.31	يمتلك القسم موارد مادية تسمح بتطبيق نظام الترياج بسهولة وبدون إعاقة					
.32	يتوفر عناصر بشرية لضبط الأمن تستطيع السيطرة على أي حالة من الفوضى في صالة الانتظار وتساهم بالالتزام في المحددات الزمنية لنظام الترياج					
.33	يوجد في صالة الانتظار لافتات توعوية كافية ترشد الجمهور بألية عمل نظام الترياج					
.34	يوجد وقت كافي لدى لممرضين لتطبيق نظام الترياج في قسم طوارئ الأطفال					
.35	ضغط العمل في قسم الطوارئ يعيق تطبيق نظام الترياج بنجاح.					

Annex 2: Helsinki Approval

المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee

For Ethical Approval

Date: 2019/10/7 **Number:** PHRC/HC/633/19

Name: Ahmed W. AbuSeda الاسم:

We would like to inform you that the committee had discussed the proposal of your study about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Nurses' Knowledge and Perception Regarding the Implementation of Triage System in Pediatric Emergency Department at Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/633/19 in its meeting on 2019/10/7

و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Dr. Yehia Abed

Chairman

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

شارع النصر - مفترق العيون

Annex 3: Ministry of Health Approval

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

المحترم رامي عيد سليمان العبادله :

التاريخ:15/10/2019
رقم المراسلة 380452

مدير عام بالوزارة /الإدارة العامة لتنمية القوى البشرية ـ /وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحث// أحمد أبو سعدة

التفاصيل //
بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحث/ أحمد أبو سعدة
الملتحق ببرنامج ماجستير التمريض – تخصص إدارة التمريض – جامعة القدس أبوديس في إجراء بحث بعنوان:ـ
Nurses' Knowledge and Perception Regarding the Implementation ofTriage System in Pediatric Emergency Department at Gaza Strip
حيث الباحث بحاجة لتعبئة استبانة من عدد من الممرضين والممرضات العاملين في اقسام الطوارئ في مستشفيات قطاع غزة (مجمع الشفاء الطبي – مستشفى الأندونيسي – مستشفى غزه الأوربي- مجمع ناصر الطبي، مستشفى شهداء الأقصى، مستشفى النجار، مستشفى بيت حانون)، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحية والتقدير،،،
ملاحظة /
1. تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 6 شهر من تاريخه.
2. البحث المذكور حصل على موافقة لجنه اخلاقيات البحث الصحي (لجنة هلسنكي)

محمد ابراهيم محمد السرساوي
مدير دائرة/الإدارة العامة لتنمية القوى البشرية ـ

Annex 4: Action Plan

The study takes 10 months; from Dec., 2018 till October 2019. This period was accomplished as illustrated in the below time table:

Time Table Activities:

Activity	Dec 2018	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019
Development of proposal	■	■											
Ethical clearance from Helsinki committee			■										
MOH approval				■									
Piloting					■								
Data collection						■	■						
Data entry								■					
Data analysis									■	■			
Research writing											■	■	
Dissemination of findings													■

العنوان: معرفة وإدراك الممرضين فيما يتعلق بتطبيق نظام الفرز في أقسام طوارئ الأطفال في قطاع غزة

إعداد: أحمد وليد أبو سعدة

إشراف: د. محمد الجرجاوي

ملخص الدراسة

يعتبر الفرز وظيفة أساسيه للممرضين في أقسام الطوارئ، كما أن معرفه الممرضين حول الفرز هي المفتاح في عمليه اتخاذ القرارات. تهدف الدراسة إلى تقييم المعرفة والتصورات الخاصة بنظام الفرز لدى الممرضين العاملين في أقسام استقبال الأطفال والمحددات التي قد تؤثر عليهم. وقد تم تصميم الدراسة الوصفية التحليلية في أقسام طوارئ الأطفال في جميع المستشفيات الحكومية في قطاع غزه. تكونت عينة الدراسة من جميع الممرضين العاملين في أقسام طوارئ الأطفال في المستشفيات الحكومية بقطاع غزة والبالغ عددهم 112 ممرض وممرضة. لجمع البيانات قام الباحث بتصميم استبانة لهذا الغرض، وقد تم عرضها على مجموعة من المحكمين، كما تم اختبار الثبات بإجراء دراسة استطلاعية على عينة من 10 استبانات، وقد كانت نتائج اختبار ألفا مرضية. لتحليل البيانات استخدم الباحث برنامج الرزم الإحصائية (SPSS Version 22).

واستخدم الباحث التكرارات، النسب المئوية، المتوسط الحسابي، الانحراف المعياري، اختبار (ت)، اختبار تحليل التباين الأحادي، واختبار بيرسون للعلاقات، وبينت نتائج الدراسة أن 76.8% من المشاركين في الدراسة كانوا من الذكور، 67.3% كانوا متزوجين، 66% حاصلين على درجة البكالوريوس في التمريض، 41.4% لديهم خبرة أقل من 3 سنوات، 61.6% كانوا ممرضين بدرجة حكيم، 42% يعملون بنظام المناوبات المختلطة (صباحي، مسائي، ليلي)، وبينت النتائج أن 33% من الممرضين التحقوا ببرنامج تدريبي خاص بعمليات الفرز. وأظهر المشاركين في الدراسة مستوى فوق المتوسط (76%) من المعلومات حول برنامج الفرز، كما أن تصوراتهم لبرنامج الفرز كانت بدرجة عالية بلغت 81%، في حين تبين وجود مستوى متوسط من التحديات التي تواجه الممرضين في تطبيق برنامج الفرز.

وأظهرت النتائج وجود علاقة دالة إحصائياً بين تصورات الممرضين تجاه برنامج الفرز والتحديات التي تواجههم في تطبيق برنامج الفرز.

وأظهرت النتائج وجود عدة عوامل أدت لارتفاع مستوى المعرفة ببرنامج الفرز ومنها تلقي تدريب خاص ببرنامج الفرز حملة درجة البكالوريوس، رئيس قسم، والذين يعملون في مستشفى غزة الأوروبي. وكان مستوى المعرفة أقل لدى الممرضين الذين تراوحت أعمارهم بين 28 – 38 سنة، ومن سكان غزة والشمال. وكان مستوى التحديات أعلى لدى الممرضين الغير متزوجين، والذين يسكنون محافظة رفح وخانيونس، في حين لم توجد فروق في كل من مستوى المعرفة، التصورات، والتحديات تعزى لكل من الجنس، سنوات الخبرة، ونظام المناوبات.

وأوصت الدراسة الحاجة لوجود برامج تدريبية لتحسين معرفة ومهارات الممرضين بخصوص برنامج الفرز للمرضى المترددين على أقسام طوارئ الأطفال في المستشفيات الحكومية بقطاع غزة وتطبيق نظام الفرز في أقسام استقبال الأطفال.