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"Assessment of Nurses' Knowledge, Perceptions, and Challenges Regarding the Implementation of a Triage System in Pediatric Emergency Departments in the Southern West Bank, Palestine."

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M. Sc. Thesis

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Assessment of Nurse's Knowledge, Perceptions, and Challenges Regarding the Implementation of a Triage System in Pediatric Emergency Departments in the Southern West Bank, Palestine.

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Dedication

I want to express my deep appreciation to Dr. Abdallah Alwawi for his exceptional guidance and invaluable feedback during my thesis work. His expert advice played a crucial role in shaping my research to fruition.

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Immense gratitude to you all.

Immense gratitude to you all

Bashar Jamal Siwad

Declaration

I'm, Bashar Siwad, certify that this thesis "Assessment of Nurses' Knowledge, Perceptions, and Challenges Regarding the Implementation of a Triage System in Pediatric Emergency Departments in the Southern West Bank, Palestine" is entirely my own original work and hasn't been submitted in consideration for any other academic or professional award. Along with acknowledging all information sources, I also declare that any help I got has been mentioned in the relevant part.

Signed: 

Bashar Jamal Ali Siwad

Date: 23 /8 /202

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Abstract

The term "triage" originates from the French word "trier," which refers to the processes of sorting and organizing. The triage nurse play a pivotal, as the initial contact for children in emergency departments, ensuring timely identification of life-threatening conditions and optimizing patient flow to reduce wait times and prevent health deterioration.
This study aimed to assess nurse's knowledge, perceptions and challenges regarding the implementation of a triage system in pediatric emergency departments in the southern west bank, Palestine.

A quantitative, cross-sectional design was used among nurses who work in pediatric emergency departments in hospitals of southern west bank, Palestine. Data was collected by using self-administered questionnaires. The sample consisted of 130 nurses selected via convenience sampling.

The results of this study showed that the level of the nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals is very low (45.2%), and also low for subjective knowledge (57.3%). The mean of nurses perceptions was high (4.06 ± 0.43) and the percentage mean is (81.2%). While the challenges were low, the mean was (3.35 ± 0.55) and the percentage mean (66.9%).

There was a significant positive correlation ($\alpha = 0.05$) between nurses' knowledge and perceptions. But no significant correlation was found between nurse's knowledge and their challenges about triage.

Finally, significant negative correlation at the level of ($\alpha = 0.05$) between nurses' perceptions and their challenges about triage.

Regarding the sociodemographic factors that affect triage, the knowledge was affected by (Marital Status, Graduation University, and Monthly Income). On other hand, nurses perception was affected by (Age, Graduation University, Workplace, Monthly Income, and Years of Experience). And many factors were founded to affect nurses challenges regarding triage including (Gender, Graduation University, Workplace, and Receiving continuous educational programs).

The study highlights a critical gap in nurses' objective knowledge of triage in pediatric emergency departments, with a mean score of only 45.2%, despite a higher perceived knowledge level. Addressing this discrepancy is essential, as improving nurses' knowledge could enhance their perceptions and ultimately mitigate the challenges faced in implementing effective triage practices.

Key words: knowledge, perceptions, challenges, triage system, pediatric emergency departments, Palestine.

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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
ER	Emergency Department
EGH	European Gaza Hospital
EMS	Emergency Medical Services
ESI	Emergency Severity Index
ETAT	Emergency Triage Assessment and Treatment
GDP	Gross Domestic Product
HCPs	Health Care Providers
HCWs	Health Care Workers
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
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

The term "triage" comes from the French word "trier," which refers to the processes of sorting and organizing (Yancey & O'Rourke, 2020). In the healthcare field, triage is employed to classify patient according to the seriousness of their injuries and to determine the sequence in which various patients need care and monitoring (Atigo & Yousif, 2021). In Pediatric Emergency Departments (PEDs), rapid and accurate triage by the nurse, who is the first point of contact, is crucial for optimizing health outcomes (Simon Junior et al., 2022). Effective triage not only identify life-threatening conditions promptly but also streamlines patient flow, minimizing wait times and preventing deterioration, especially for vulnerable pediatric patients (Alzamel et al., 2025). Triage in an Emergency Department (ED), referring to the prioritization of patients based on the urgency of their condition. Its main purpose is to quickly identify those with life-threatening or serious conditions who require immediate care, initiate necessary interventions, and then direct the patient to the appropriate area within the ED for further treatment (Afaya et al., 2017).Triage in the ED prioritizes pediatric patients particularly when demand exceeds available capacity, ensuring those in critical need receive timely interventions (Yancey & O'Rourke, 2020).

As the demand on (EDs) continues to rise globally, triage remains a crucial process for managing the flow of pediatric patients safely. It ensures that children who require urgent medical attention receive prompt care, especially during periods of overcrowding. Identifying pediatric patients at high risk of death is essential in the ED to provide appropriate treatment and to recognize those who may need more intensive care or potential admission to the (PICU) (Aloyce et al., 2014).Despite the critical importance of structured triage systems in emergency care, their implementation varies widely between high-resource and low-resource settings. In low-resource environments, challenges such as limited availability of trained personnel, inadequate infrastructure, and insufficient access to standardized training programs often hinder the effective adoption of triage protocols. These limitations can compromise patient prioritization and delay critical interventions, ultimately affecting outcomes in emergency situations. In many low-income countries, including regions such as the southern West Bank, the absence of standardized triage protocols leads

to delays in treatment, increased mortality rates, and inefficient use of medical resources (El-Hussein & Cuncannon, 2021; Ye, Zhu, Ding, & He, 2021). Many families overestimate the urgency of their child's condition, leading to frequent low-acuity visits to PEDs. This overwhelms emergency services that might be better utilized for genuine emergencies, while primary care services could effectively manage less urgent cases (Carolina Vega et al., 2021).

Nurses play a vital role in the triage process, as their knowledge, perceptions, and clinical experience directly affect the accuracy of patient prioritization and the quality of emergency care provided (Demirer et al., 2023). Educational programs designed to improve triage skills operate on the premise that increased knowledge enhances clinical decision-making. Common training models such as the Emergency Triage Assessment and Treatment (ETAT), the South African Triage Scale (SATS), and the Canadian Triage and Acuity Scale (CTAS) have been widely implemented to support structured learning and practical application of triage principles. These programs focus on rapid assessment, prioritization based on clinical urgency, and standardized decision-making protocols, aiming to improve both the accuracy and consistency of triage across various healthcare settings.

Therefore, assessing nurses' knowledge and identifying challenges in implementing triage systems in PED is essential to improving patient outcomes. Using evidence-based triage practices also helps public healthcare systems manage their resources better. When children with non-urgent conditions are guided toward primary care instead of emergency departments, this reduces pressure on hospitals and improves overall cost-effectiveness. Studies have shown that strengthening family health centers and increasing parents' awareness of when to seek emergency care can significantly reduce unnecessary visits to PED (Butun, 2024; Eker & Imam, 2025; Owsley, Bauer, & Mays, 2022).

The severity of conditions in patients presenting to the PED can vary greatly. While many children need only basic care, those with more serious medical conditions often face delays in receiving initial treatment. As a result, their conditions can worsen, leading to hospital admissions that might have been prevented with more timely intervention (Crouse et al., 2016).

1.2 Statement of the Problem:

Currently, empirical evidence addressing triage knowledge and practices among ED nurses in Palestine remains scarce. However, a notable study conducted in pediatric emergency departments across governmental hospitals in the Gaza Strip assessed nurses' knowledge, perceptions, and challenges regarding triage implementation. The results revealed that only 33% of participating nurses reported receiving any formal triage training. Despite this, participants demonstrated above-moderate knowledge (76%) and a high level of positive perception (81%) toward triage, although they also reported moderate levels of implementation challenges (57%). Moreover, the study found that nurses with higher academic qualifications (such as a bachelor's degree),

those in managerial positions, and those affiliated with more established institutions had significantly better triage knowledge. Conversely, lower levels of knowledge were reported among nurses aged 28–38 and those working in northern Gaza and Khan Younis. Additionally, single nurses and those residing in Khan Younis and Rafah reported facing greater barriers to implementing triage effectively (Abu Seda, 2020). These findings highlight the significant role that both sociodemographic and organizational factors play in shaping triage knowledge and its application within the Palestinian context.

Although local research on triage performance in Palestine is limited, international findings offer useful context. Yoon et al. (2023) found that triage accuracy is influenced by prior experience in pediatric departments and varies between nurses in pediatric and adult EDs. These differences, however, have not been examined in the Palestinian context, where specialization and hands-on experience are often overlooked in assessing triage competency.

However, limited access to primary care is a known barrier to reducing low-acuity visits to the pediatric emergency department (PED). Despite this, Farion et al. (2015) found that even families with access to primary care often visited the PED for non-urgent issues due to misjudging the severity of their child's condition. This misperception can place additional pressure on triage nurses, who must balance clinical assessment with parental anxiety, and may complicate the prioritization process by requiring more time to reassure families while ensuring appropriate triage categorization.

Early identification and stabilization of acutely ill infants and children enhances outcomes in all settings, regardless of available resources. When resources are limited, measures such as implementing triage training and processes, utilizing clinical practice guidelines, and closely supervising and monitoring patients can significantly reduce mortality rates among critically ill children (Abdulmutalib, et al 2017).
The absence of a specified, well-established specialized emergency facilities in Palestine, along with insufficient human and material resources to treat injured or critically ill individuals, inadequate medical training on triage principles and emergency management, and a scarcity of sustenance all lead to a significant burden in the triaging process in Palestine (Rosenbloom, et al, 2022).

1.3 Justification

Several studies have highlighted deficiencies in nurses' practice regarding emergency triage, particularly in pediatric settings. For instance, (Alshaibi, et al, 2021) reported that 51.3%, 56.6%, and 59.9% of cases were mis-triaged by nurses, reflecting a significant gap between knowledge and practical application. In a study conducted in Gaza, (Seda, 2020) found that nurses demonstrated a relatively high level of

awareness (81%) and above-moderate understanding (76%) of the triage system, yet still faced moderate challenges (57%) in its implementation within pediatric emergency departments.
The knowledge and perception of nurses is crucial for the effective implementation of triage, especially in paediatric care settings. Nurses are often the first point of contact in emergency and acute care, and their ability to assess, prioritize and respond to paediatric patients can have a significant impact on health outcomes. A well-informed and positively involved care workforce ensures the consistent and accurate application of triage protocols, which reduces delays in care and improves the chances of timely intervention in critically ill children (AlShatarat et al., 2022).

Moreover, nurses' perception of the triage system - such as its reliability, efficiency and fairness - may affect their adherence to procedures and their confidence in making quick decisions. Therefore, improving the knowledge and the perception of nurses through targeted training and support policies is essential to optimizing paediatric triage and ultimately improving health outcomes (Seda, 2020).

Despite some research in neighboring regions, few studies have specifically examined the knowledge, perceptions, and challenges that faces nurses regarding triage systems in pediatric emergency settings (AlShatarat et al., 2022; Anand et al., 2023; Yoon, Park, & Chang, 2023). This gap is particularly relevant in the Palestinian context, where pediatric emergency departments (PEDs) in the West Bank face severe overcrowding and function under limited healthcare infrastructure and resources.
When properly implemented, triage systems can significantly improve patient outcomes and resource allocation, even in low-income countries. However, triage often remains one of the weakest components of healthcare delivery in such contexts. The situation in Palestine is further compounded by the lack of specialized pediatric triage protocols and by the tendency to apply similar triage approaches for both adult and pediatric patients, despite clear developmental and clinical differences (Alshaibi et al., 2021).

This study seeks to address these gaps by focusing on pediatric emergency triage in the West Bank. It aims to evaluate nurses' knowledge, perceptions, and challenges in triage practice, and to identify areas where targeted educational interventions and system improvements are needed. Compared to previous studies such as (Seda, 2020), which involved a single site and a smaller sample size (135 Nurses), this study adopts a multi-center approach and includes a broader target population to enhance generalizability.

Furthermore, the urgency of improving pediatric emergency triage in Palestine has been intensified by recent political instability and military aggression. The Israeli occupation's latest war has deepened the already critical shortages in professional staff, medical equipment, and essential healthcare services, placing further strain on an already fragile healthcare system.

In West Bank, Palestine there is a lack of published articles related to this topic. Therefore, the results of this study can help in filling this gap, and it could be used as a base for future studies in Palestine and worldwide.

The findings will also be useful in particular in the fields of education, research and care. In education, the study highlights the need to integrate comprehensive triage training into the nursing curriculum, to equip future nurses with the critical skills and knowledge needed for effective pediatric emergency care. In the area of research, the study opens up new avenues for further investigation of the relationship between nurses' knowledge, attitudes and patient outcomes and supports evidence-based improvement in triage systems.

1.4 Research Objectives

1.4.1 General Objective

This study aims to assess nurses' knowledge, perceptions and challenges regarding the implementation of a triage system in pediatric emergency departments in the southern West Bank hospitals, Palestine.

1.4.2 Specific Objectives

1. To assess the nurses' knowledge about the implementation of triage in pediatric emergency departments at the Southern West Bank hospitals
2. To assess the nurses' perceptions about the implementation of triage at pediatric emergency departments at the southern West Bank hospitals.
3. To assess the challenges that impact nurses during the implementation the triage in pediatric emergency departments at the Southern West Bank hospitals.
4. To examine the association between nurse's knowledge, perceptions, and challenges related to triage implementation in pediatric emergency departments of Southern West Bank hospitals.
5. To examine the associations between nurses' sociodemographic characteristics and their knowledge, perceptions, and challenges regarding triage implementation in pediatric emergency departments at the Southern West Bank hospitals.

1.5 Research Questions

1. What is the level of nurses' knowledge regarding pediatric triage implementation in emergency departments of Southern West Bank hospitals?
2. What are nurses' perceptions triage implementation in pediatric emergency departments of southern West Bank hospitals?

3. What are the barriers and challenges do nurses encounter when implementing triage in pediatric emergency departments of Southern West Bank hospitals?
4. Are there relationships between nurses' knowledge, perceptions, and challenges related to triage implementation in pediatric emergency departments of Southern West Bank hospitals?
5. Are nurses' knowledge, perceptions, and challenges regarding triage implementation in pediatric emergency departments of Southern West Bank hospitals associated with their sociodemographic and clinical characteristics?

1.6 Context of the study

- Sociodemographic context

The total area of historic Palestine is estimated at approximately 27,000 square kilometers, stretching from the Mediterranean Sea in the west to the Jordan River in the east, and from Ras al-Naqoura in the north to Rafah in the south. Since the Nakba of 1948, most of this land has been under occupation, leaving only the West Bank (approximately 5,655 km²) and the Gaza Strip (approximately 365 km²) as the administratively recognized territories under the name of the State of Palestine.(Reuters, 2025)

According to recent estimates by the Palestinian Central Bureau of Statistics (PCBS), the population of Palestine reached around 5.59 million by mid-2025. Urban residents make up roughly 84.2% of the population, and the median age is about 20.1 years, reflecting a predominantly young demographic. The annual population growth rate stands at 1.71%, with a slightly higher rate in the Gaza Strip than in the West Bank. Children under the age of 15 represent around 37% of the population, and over 65% are under the age of 30 (PCBS , 2025).

In terms of regional distribution, the West Bank hosts approximately 3.35 million individuals, while the Gaza Strip has around 2.1 million residents—down from 2.23 million in 2023, largely due to the devastating impacts of the ongoing conflict. Population density remains a significant issue: while the national average is 929 persons per km², the West Bank has about 585/km², and the Gaza Strip—one of the most densely populated areas in the world—exceeds 5,700/km² (PCBS , 2025).

- Economic context

The Palestinian economy has been under intense strain due to the persistent Israeli siege, a situation that worsened following the recent conflict which further deepened the economic challenges. Over the past year, economic conditions in the Palestinian territories, particularly in the West Bank, have declined steadily. Based on the latest reports from the Palestinian Central Bureau of Statistics, unemployment in the West Bank surged from 18% in 2023 to around 31% in 2024. Correspondingly, the number of unemployed individuals increased significantly, while the workforce experienced a notable reduction, decreasing by approximately 20% over the same period. Moreover, employment opportunities for Palestinians within Israel have sharply diminished, largely because of stricter mobility restrictions, falling from over 100,000 workers in 2023 to just over 20,000 in 2024. These factors collectively exacerbate the fragile economic landscape and create additional challenges for the population's livelihood((PCBS), 2024; Reuters, 2025).

- Health care system in Palestine

The Palestinian health system consists of several entities that provide healthcare services, including the Ministry of Health (MOH), Non-Governmental Organizations (NGOs), the United Nations Relief and Works Agency for Palestine Refugees (UNRWA), military health services, and the private sector. The total number of hospitals in Palestine is 91, with 56 located in the West Bank, including East Jerusalem, and 35 in the Gaza Strip. Among these hospitals, the Ministry of Health owns 15 hospitals in Gaza, NGOs own 18 hospitals, the Ministry of Interior and National Security operates 3 hospitals, and the private sector runs additional hospitals.

According to the World Health Organization (WHO), the total number of functional hospital beds in the Gaza Strip has dropped significantly due to the ongoing conflict. As of May 22, 2025, there were only 1,929 hospital beds available across the territory, compared to around 3,500 beds before October 2023. This includes approximately 1,388 inpatient beds, 67 intensive care unit (ICU) beds, and 69 neonatal incubators, which are severely insufficient to meet the growing health needs of the population. Only 17 out of 36 hospitals remain partially operational, with five major hospitals accounting for about 75% of the remaining hospital bed capacity (Organization, 5 June 2025).

Two of the key hospitals still functioning are Nasser Medical Complex and Al Amal Hospital in Khan Younis, both operating under extreme conditions, with occupancy rates exceeding 100% and even 180%, respectively. The reduction in functional beds reflects damage to infrastructure and fuel shortages, forcing 18 hospitals to completely shut down and leaving the remaining ones operating at less than half their former capacity ((OCHA), 22 May 2025).

Although exact distributions by managing authority are not fully available post-conflict, estimates suggest that public hospitals under the Ministry of Health (MoH) now manage approximately 1,300–1,400 beds, non-governmental organizations (NGOs) operate fewer than 400 beds, and hospitals under the Ministry of Interior and National Security likely have fewer than 100 beds remaining (Gaza, 2021)..

Regarding healthcare staff, according to the World Health Organization (2024), Gaza's Ministry of Health employed approximately 5,000–6,000 physicians and around 11,000 nurses and midwives prior to the escalation in October 2023. However, due to severe infrastructure damage and insecurity, only 20–30% of these healthcare workers remained active by mid-2024, significantly lowering the availability of medical personnel. This means that the number of active physicians dropped to an estimated 1,100–1,650 (approximately 5.8–8.7 per 10,000 population), while active nurses and midwives likely number around 2,200–3,300 (approximately 11.6–17.4 per 10,000 population) (Organization, 2024). Regarding emergency healthcare services, the most recent publicly available data from the Palestinian Ministry of Health reported that in 2020, there were approximately 1,139,000 visits to emergency departments in Gaza hospitals (Gaza, 2021)

It is important to note that not all of the hospitals mentioned below have designated pediatric emergency departments. However, all of them perform initial triage for pediatric emergency cases upon presentation. Following triage and initial assessment, children requiring specialized pediatric care are referred to hospitals equipped with dedicated pediatric emergency services. This process ensures that pediatric patients receive timely evaluation while facilitating appropriate transfer to higher-level care when necessary.

- **Beit Jala Governmental Hospital Hussein (Bethlehem)**

  Beit Jala Government Hospital (Hussein Hospital) in Bethlehem is a public healthcare facility that provides comprehensive medical services to the local community in Beit Jala and the surrounding areas. Established with the goal of delivering high-quality healthcare, the hospital is one of the most important medical institutions in the West Bank. The hospital offers a wide range of services, including pediatric emergency care.
- After contact with the hospital nursing director a capacity of around 140 beds, Beit Jala Government Hospital is one of the largest hospitals in the region, able to accommodate a significant number of patients across various departments. The hospital employs over 400 staff members, including specialized doctors, nurses, technicians, and administrative personnel, all of whom are highly skilled and dedicated to providing quality medical care.
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  - **Hebron Governmental Hospital Alia (Hebron)**

  Through contact with the hospital nursing director Hebron Government Hospital (Alia Hospital) is a public medical facility located in the city of Hebron, Palestine, and is

one of the largest hospitals in the southern West Bank. Established to provide comprehensive and advanced healthcare services to residents of Hebron and surrounding areas, it is considered one of the region's key healthcare institutions. The hospital offers a wide range of services, including pediatric emergency department, surgery, pediatrics, obstetrics and gynecology, cardiology, intensive care, radiology, and physical therapy. With a capacity of around 200 beds, Hebron Government Hospital can accommodate a large number of patients across various departments. The hospital employs approximately 600 staff members, including specialized doctors, nurses, technicians, and administrative personnel, all committed to providing high-quality medical care.

Caritas Baby Hospital (Bethlehem)

Caritas Baby Hospital in Bethlehem is a non-profit medical facility established in 1967, dedicated to providing high-quality healthcare services to children. The hospital offers comprehensive medical care in various fields, including pediatrics, surgery, ophthalmology, pediatric cardiology, obstetrics, pediatric mental health, and physical therapy. It also operates a 24/7 emergency department specifically for children and specialized outpatient clinics. With a capacity of around 80 beds, the hospital serves children in Bethlehem and the surrounding areas, playing a vital role in the healthcare system of the southern West Bank. The hospital employs over 300 staff members, including experienced pediatric specialists, nurses trained in child care, technicians, and administrative personnel. In addition to patient care. Allthese informations taken after contact with the hospital nursing director

- **Bethlehem Arab Society for Rehabilitation (BASR) (Bethlehem)**

The Bethlehem Arab Society for Rehabilitation (BASR) is a leading institution in the West Bank, providing comprehensive medical, surgical, and rehabilitation services, particularly for people with disabilities. With a dedicated team of over 350 professionals, including doctors, therapists, technicians, and administrative staff, all are specialists in pediatric care (After contact with the hospital nursing director)

- **Al Yamama Specialist Hospital (Bethlehem)**

The head of nursing diresctor of Al Yamama Specialist Hospital reprted that it is a private healthcare facility located in the town of Al-Khader in the Bethlehem Governorate, in the southern West Bank.

The hospital was established on September 24, 1997, initially as a medical center providing emergency services and outpatient clinics. On August 1, 1999, it was officially recognized by the Palestinian Ministry of Health as a specialized hospital, contributing significantly to the improvement of healthcare services in the Bethlehem and Hebron governorates.

Al Yamama Specialist Hospital provides healthcare services to approximately 500,000 residents of the Bethlehem and Hebron governorates.

The hospital offers the following specialized clinics: Pediatric Clinic, Obstetrics and Gynecology Clinic, Ophthalmology Clinic, Internal Medicine Clinic, Cardiology Clinic, ENT (Ear, Nose, and Throat) Clinic, Surgery Clinic, Endocrinology Clinic, and General Medicine Clinic.

In addition to these specialized clinics, the hospital provides various services including pediatric ER .

- **Al-Ahli Hospital (Hebron)**

Al-Ahli Hospital in Hebron was established in 1988 on a 27,500 square meter area, which was later expanded to 30,000 square meters, with a total of 304 beds upon the completion of the project. The hospital offers comprehensive medical services equipped with the latest medical technology, serving over 160,000 patients annually, including 28,000 admissions. It employs 880 staff members across various medical, support, and administrative departments. The hospital also houses a nursing college that offers programs in nursing, midwifery, and anesthesia technicians, in addition to providing training programs for doctors and nursing students from various universities (Through contact with the hospital nursing director).

- **Al Mizan Specialist Hospital (Hebron)**

Al Mizan Specialist Hospital was established in 1996 in the city of Hebron, Palestine, and began its medical activities in 1999. On September 1, 2008, a group of doctors, under the name "Al-Ghad Medical Services Company," reached an agreement with the management of Al Mizan to operate and manage the hospital. Their goal was to provide exceptional medical and hospitality services, while also introducing new departments that were not available in Palestine, aiming to alleviate the burden of traveling abroad for treatment by collaborating with international medical institutions.

The hospital consists of seven floors and covers an area of 9,198 square meters. It operates with a capacity of 50 beds, with the ability to increase. Each year, the hospital handles approximately 16,000 patients, including both inpatient admissions and outpatient visits. These informations taken through contact with the hospital nursing director.

Palestinian Red Crescent Society Hospital (Hebron)

Palestinian Red Crescent Hospital - Hebron is a non-profit medical facility located in Hebron, Palestine, and is one of the key healthcare institutions in the region. Established in 1964 under the supervision of the Palestinian Red Crescent Society, the hospital provides comprehensive medical services to the local community and plays a vital role in healthcare in the southern West Bank. The hospital offers a wide range of medical services, including emergency care, surgery, pediatrics, obstetrics and gynecology, intensive care, radiology, and internal medicine. It also features specialized departments in public health,

outpatient clinics, and long-term care services.
With a capacity of around 120 beds, and more than 500 staff members, including specialized doctors, nurses, technicians, and administrative personnel, and highly specialized pediatric ER (Through contact with the hospital nursing director).

- **1.9 Conceptual Framework**

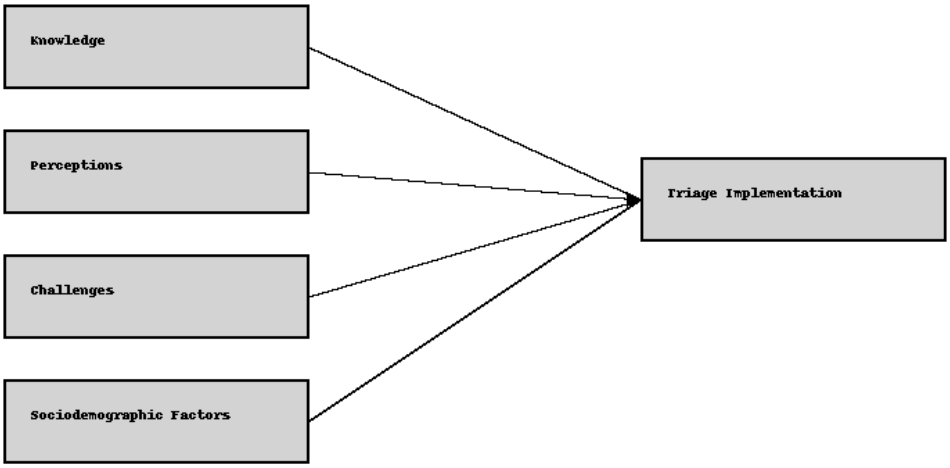

Figure (1.1). Conceptual Framework

In this study, the independent variables were nurses' knowledge, perceptions, and challenges related to triage, while the dependent variable was the implementation of triage. The researcher highlights that, as shown in the figure above, the challenges to triage implementation include factors such as the lack of prior research, insufficient equipment, and staff shortages (Mélot, 2015).

Chapter Two

Literature Review

2.0 Introduction

This chapter reviews existing literature related to the implementation of triage, with a focus on its definitions, importance, challenges, and barriers. The review highlights how triage decisions are influenced by patient characteristics, healthcare providers, and the healthcare environment. By synthesizing findings from previous studies, the chapter establishes the basis for understanding factors that affect triage implementation, particularly in emergency departments and psychiatric hospital settings.

2.1 Background

The process of making triage decisions is shaped by three interconnected factors: the patient's characteristics, the triage decision-maker, and the healthcare environment. Triage plays a crucial role in reducing waiting times and admission rates, optimizing the efficiency and effectiveness of the emergency department (ED), improving patient and family satisfaction, enhancing healthcare quality, managing financial resources, and evaluating the performance of ED activities. While triage has been recognized as important in EDs in developed countries for some time, many less-developed countries, including those in the Eastern Mediterranean Region (EMR), are not fully leveraging the potential of this health development strategy. Psychiatric hospital EDs, in particular, have significant progress to make in realizing the benefits of triage (Ouellet et al., 2023).

2.2 Definition of triage system

Triage is a procedure that involves the prompt and precise recognition of patients needing urgent care, differentiating them from others with ailments or diseases whose conditions can be delayed (AlShatarat et al., 2022).

Proper triage guarantees that healthcare organizations can handle overall patient needs, particularly in times of disasters, pandemics, and other public health crises (Yoon et al., 2023).

2.3 Importance of triage system

The triage system is viewed as the initial measure to guarantee patient safety, forming a crucial element of healthcare quality and representing a significant global public health issue. Patient safety is affected by various factors and differs based on the healthcare system's level (Fekonja et al., 2023).

In the healthcare system, triage in the emergency department acts as a vital entry point and significantly impacts the health of the population (AlShatarat et al., 2022).

Triage is crucial in ED because it assesses the urgency and severity of a medical condition and provides suitable care management. Thus, it is essential to implement an effective triage system (Zagalioti et al., 2023).
Triage is an element of decision-making in healthcare, and accurate and prompt decision-making leads to the best outcomes in the proper management of patient treatment and care. The outcome should lead to improved care and shorter patient waiting times in the ED (Butler et al., 2023).

2.4 Challenges and barriers in triage implementation

Numerous complications exist in healthcare facilities concerning efficient triage, including inadequate execution strategies and training activities, challenges in sustaining changes, lack of motivation, difficulties in achieving consensus, and information organization, insufficient training on triage for nurses to comprehend their roles in this area, communication issues, limited resources and equipment, hiring inexperienced personnel for the triage unit, and the absence of a triage nurse in the emergency department (Pishkhani et al., 2023).

A prior systematic review, which aimed to explore and classify the main challenges in triage practice, identified seven categories of challenges in the triage field globally, which include: 1- Occurrence of mis-triage and the misuse of important emergency resources, 2- Limited understanding of current triage algorithms, 3- Numerous triage algorithms, development of new ones, and their unfamiliarity to healthcare staff, 4- Ethical dilemmas faced by triage users, 5- Shortages of computer tools and artificial intelligence or their ineffectiveness, 6- Gap between knowledge and practical application by healthcare workers, and 7- Absence of formalized simulated training programs (Abbasi Dolatabadi et al., 2022).

2.5 Triage models and systems in Pediatric emergency department

Given that triage systems have mainly been designed for adults, it is crucial to create standardized triage systems for children's care. An effective pediatric triage instrument would produce consistent information in the ED, irrespective of variations in clinical presentation, and would act as a measure of healthcare service quality (Simon Junior et al., 2022).
A patient's clinical urgency does not distinctly indicate the complexity or seriousness of their condition. Triage, however, acts as a crucial indicator of the vital timeframe for medical intervention (Magalhães-Barbosa et al., 2019).
Nonetheless, at present, there is not a standardized tool for pediatric patients that is used regularly. One challenge in creating such a standard tool is the differences in clinical parameters across various age categories. Another worry is that a seriously ill child might seem stable at first but then quickly worsen. Consequently, a triage instrument might not offer enough alert in the early phases to guarantee proper treatment (Sax et al., 2024).
Certain pediatric alert triage systems enable quick identification of the patient's condition severity through a swift evaluation of physiological indicators; any change in these indicators signals the necessity for immediate medical assessment.

Nevertheless, merely documenting vital signs is insufficient to recognize critically ill patients in an emergency department (Simon Junior et al., 2022).
Color scales can consist of three levels (traffic light system), four levels, or five levels. Certain instruments are utilized in private organizations without adequate documentation and despite their dubious reliability (Ma et al., 2021).
In contrast to instruments with three classification levels, those with five levels relate not only to quality assurance but also to management indicators such as resource usage, hospital admission rates, and emergency department length of stay, ICU transfers, or mortality rates. They have been endorsed by both national and global organizations for emergency triage.8,13 These categories are arranged in ascending numerical or color order from levels 1 to 5, representing immediate, very urgent, urgent, standard, and non-urgent (Sax et al., 2024).

2.6 Impact of triage system on healthcare quality

A single-group pre-posttest study design (Bahlibi et al., 2022) was conducted in the adult emergency departments. Every staff member in the ED participated. The tools used for data collection included a self-administered questionnaire for assessing knowledge and a checklist for observing practices. The level of statistical significance was established at $P < 0.05$. The findings of this research indicated that the average knowledge scores at Time 1 (before the intervention), Time 2 (after the intervention), and Time 3 (three-month follow-up) were 6.23 (SD = 2.29), 10.55 (SD = 1.79), and 9.39 (SD = 2.67), respectively. In the pre-intervention phase, just one (3%) nurse was found to possess sufficient knowledge. Two days after training (immediate post-intervention), the percentage with sufficient knowledge rose to 39% but fell to 19% three months later. Statistically significant mean knowledge difference scores (95% CI) were observed between immediate post and pre-intervention, three months later and pre-intervention, as well as immediate post and three months later. The median score for suitable triage practices before the intervention showed no significant difference ($p = 0.053$) compared to the post-intervention score.
A systematic review (France et al., 2022) and meta-analysis were performed to assess the overall accuracy, under-triage, and over-triage of the START method utilized by providers from diverse backgrounds; and (2) to determine specific accuracy for each of the four START categories: red, yellow, green, and black. A total of thirty-two studies were part of the review, with the majority employing a non-randomized study design (84%). The percentage of victims accurately triaged with START varied between 0.27 and 0.99, The results indicated a moderate level of overall triage accuracy, with some degree of both over-triage and under-triage.
Previous systematic review (Mitchell et al., 2024) examined the impact of triage implementation on clinical outcomes and process metrics in emergency departments (EDs) of low- and middle-income countries (LMICs). The findings of this review indicated that out of 10,394 articles discovered via the search strategy, 58 were analyzed in full text and 16 were incorporated into the final synthesis. All employed

pre-/postintervention techniques and most were single center. Measures of effect consisted of mortality, time on the waiting list, duration of hospitalization, rate of admissions, and satisfaction levels of patients. Among these, ED mortality and the duration until clinician assessment were the most commonly evaluated. Most studies utilizing these outcomes found a beneficial effect, specifically a decrease in mortality and waiting time for patients seeking emergency care. The evidence quality was moderate for these measures, but low or very low for all other outcomes and indicators of processes.

2.7 Impact of triage system on waiting times of pediatric patients.

A systematic review employing narrative analysis was performed to investigate the effect of team triage on waiting durations in adult emergency departments. The research revealed that having senior emergency physicians work with the triage nurse facilitates quicker decision-making and proper investigation requests. Requesting an early bed or referring to a specialist consultation was also observed to enhance waiting times. Fewer patients leaving without being seen and decreased mortality rates were noted with the implementation of team triage. Team triage also enhances patient satisfaction (Corkery et al., 2021).

2.8 Triage scales

Australian Triage Scale (ATS)

A retrospective observational study involved 356 patients during a 2-year timeframe who arrived at an urban hospital's emergency department(Ryan et al., 2024). The ATS was utilized and divided into three categories: ATS 1/2, ATS 3, and ATS 4/5. The main results examined the connection between ATS and hemodynamic parameters. Secondary outcomes assessed the percentage of patients with suspected variceal bleeding who were assigned a non-life-threatening ATS category.

A study (Elsayed et al., 2020) was carried out to compare the effectiveness of the Australasian Triage Scale and the Emergency Severity Index triage system. The complete medical history of 167 patients who came to the ED from January to March 2016 was documented, including chief complaints, examinations, and resource numbers, and was triaged using both systems. The findings showed that the most common age range was between 20 and 40 years, whereas the least common age range was those aged 80 and older. The occurrence of male patients was greater than that of female patients. ATS and ESI were mutually accepted at urgency level 1. Urgency levels 2 and 5 were greater in the ESI system, whereas urgency levels 3 and 4 were greater in ATS. Most of the patients were released, whereas just 2.4 percent had passed away. There were minimal differences between the ATS system and the final result concerning the level of urgency. There was considerable over-triage in urgency level 2, whereas there was marked under-triage in urgency levels 3–5 when compared to the final outcome.

Manchester Triage System (MTS)

To compile the most reliable evidence regarding the impact of the Manchester Triage System (MTS) on treatment time (TtT) for patients attending the emergency department (ED), a study (Cicolo et al., 2020) was carried out. The analysis encompassed two before-and-after studies, involving a total of 2265 participants. One study was of average quality, while the other was of superior quality. One study focused exclusively on patients with acute ischemic stroke, whereas the other involved patients with various complaints. Both studies were conducted with sequential samples. The median TtT was 10 minutes prior to the MTS implementation and 12 minutes subsequent to the MTS implementation in the research that involved patients with various complaints. In the research involving patients with acute ischemic stroke, the median TtT reduced by 15 minutes following the implementation of the MTS (from 75 to 60 minutes).

2.9 Nurses' knowledge and perceptions on implementation of a triage system in pediatric emergency departments

A hospital-based cross-sectional comparative descriptive study was designed to assess nurses' knowledge regarding triage. The results of this study indicated that a statistically significant correlation exists between age and knowledge, demonstrating that the knowledge level of ED nurses concerning triage improves as they age among DMC ED nurses. However, no statistically significant correlation was observed between age and knowledge among nurses in the KFUH ED. Additionally, a statistically significant correlation was observed between experience and knowledge among (KFUH) ED nurses compared to DMC ED nurses, where no statistically significant correlation existed between years of experience and knowledge. This indicates that the expertise grows with additional years of work experience for nurses in the KFUH ED. Additionally, the gender of ED nurses, their educational qualifications, and the training programs they completed showed no statistical significance in either hospital (AlMarzooq, 2020).

Olofinbiyi and Makhado 2024 conducted a study to identify the elements that influence the triage process during care delivery. The findings of this study indicated that among the 100 respondents, 89% believed that several factors continue to hinder the advancement of triage, whereas 11% (11) felt that no factors hinder the progress of triage.

A convenience sample of 80 nurses was utilized to evaluate the perception and satisfaction of nursing staff concerning the application of triage in the emergency department. The findings of this research indicated that 58.8% of the nurses assessed had a satisfactory level of knowledge, 61.3% had an adequate level of overall perception, 63.8% had an adequate level of overall practices, and 63.8% reported a positive satisfaction level regarding triage application in the emergency department (Alazaka and Mohamed, 2024). The findings of this research indicated that 58.8% of the nurses examined possessed a satisfactory knowledge level, 61.3% of the nurses

had an adequate overall perception, 63.8% displayed a sufficient level of overall practices, and 63.8% expressed a positive satisfaction level regarding the triage application in the emergency department.

Anand et al. (2023) investigated the present condition of triage use and its effects on the allocation of responsibilities in Indian EDs. . In this research, nurse participants demonstrated insufficient knowledge and awareness regarding the Pediatric Assessment Triangle (PAT), which is employed for rapid initial assessment (62.18% across all participants). Regarding the overall triage procedure relevant, particularly in pediatric emergency departments, their knowledge and comprehension were even more lacking; for instance, recognizing primary (28.27%) and secondary (22.69%) survey elements through targeted history and examination, accurately employing temperature evaluation (23.32%) and immediate blood glucose monitoring (22.95%) during triage, along with awareness of different kinds of globally recognized triage systems for emergency department health services like the Emergency Severity Index (ESI), Canadian Triage and Acuity Scale (CTAS), and Australasian Triage Scale (15.87%).

Previous study was conducted by Seda (2020) to assess nurses' knowledge and perceptions regarding the implementation of the triage system in pediatric emergency departments (PEDs) in Gaza Strip using a descriptive, analytical, cross-sectional design. The results showed that socio-demographic factors did not significantly affect nurses' knowledge or perceptions, with an average knowledge score of 76%. The study highlights the need to improve nurses' triage knowledge and skills, as triage plays a key role in decision-making.

Another study conducted by Wolf et al. (2018) to examine emergency nurses' perceptions and experiences with the triage process. The study found that nurses often described triage processes that were influenced by unit-specific or individual practices, where adjustments to the triage system were made to address issues with ED flow, rather than strictly adhering to a standardized triage system. The study's contribution to emergency nursing practice is significant, as it highlights how environmental factors can impact the decision-making abilities of nurses. The authors suggest that clear metrics and assessment tools for evaluating triage competencies are necessary for improving the effectiveness and consistency of triage in the ED.

Also, Ponsiglione et al. (2018) conducted a study to examine the various factors influencing the accuracy of triage decisions. The study found that errors in triage assessment emerge from the interaction between individual and contextual or organizational factors. Additionally, patterns of these factors varied across different organizational settings, highlighting the importance of considering the broader context in which nurses make triage decisions. The study emphasizes that previous research has largely focused on individual factors in isolation, overlooking the complex, non-

linear relationships between various factors. The authors argue that a more comprehensive approach is necessary for understanding and improving triage decision-making.

A cross-sectional study was aimed to evaluate the triage knowledge and practices, along with their influencing factors, among emergency department nurses working at King Fahad Medical City (KFMC), Saudi Arabia. A total of 147 nurses from the emergency department participated in the study. Participants showed overall strong levels of triage knowledge and triage skills. Nonetheless, deficiencies in knowledge and inappropriate practices concerning certain aspects were observed. No notable differences in triage knowledge and practice were observed based on participants' demographics such as gender, job title, qualifications, emergency nursing training, and prior triage training ($P > 0.05$). The majority of participants ($n = 141$, 95.9%) had access to their triage systems, and a significant number ($n = 79$, 53.7%) use these systems every day. Half indicated that only registered nurses took on the triage responsibilities ($n = 69$, 46.9%). A notable positive correlation existed between triage knowledge and practice ($r = 0.486$, $P < 0.01$). (AlShatarat et al., 2022)

A total of eleven emergency nurses ($N = 11$) employed in the pediatric emergency department of a university hospital in Seoul, South Korea, were selected through purposive sampling techniques. Phenomenography was employed to explore the methods that these nurses apply when utilizing the Korean Triage and Acuity Scale for triaging pediatric patients. The results included 2 descriptive categories: 6 methods for triaging patients (categories of how) and 3 techniques (categories of what) employed by pediatric emergency nurses to triage pediatric patients utilizing the Korean Triage and Acuity Scale (Yoon et al., 2023).

A descriptive cross-sectional, observational design was employed to evaluate the knowledge, skills, and practices in patients' triage among 125 emergency nurses working in triage at emergency departments in Jordan. The results showed that 88.8% of nurses possessed adequate knowledge of triage, 84.8% exhibited moderate triage abilities, and 88.8% practiced good triage methods. There was a statistically significant positive correlation among triage knowledge, emergency experience, and triage training course. A notable positive correlation was identified among triage skills, emergency background, triage experience, and triage training program. Additionally, triage methods showed a notable positive correlation with triage expertise and triage training programs (Malak., 2022).

A cross-sectional study design involving multiple centers was utilized. Three hospitals were deliberately chosen. This study included a total of 384 participants. The percentages of inadequate triage knowledge and perceived insufficient triage skills among nurses were 58.1% and 50.3%, respectively. The level of education, experience in triage, training background, and access to triage equipment were

important indicators of triage knowledge and perceived competence in triage skills, respectively (Baher et al., 2024).

A different cross-sectional descriptive study was conducted between April and June 2021, involving (48) nurses employed in the emergency department. The results showed that 68.8% were female and 45.8% had an average age of 31.79. Nurses demonstrated a moderate understanding of triage. Bachelor of science in nursing degree ($p = 0.005$, $B = 10.659$), experience for ≥5 years ($p = 0.002$, $B = 10.670$), and triage training courses ($p = 0.001$, $B = 12.418$) were statistically significant factors impacting emergency nurses' knowledge.

A quantitative study of an analytical descriptive nature employing a cross-sectional method to assess the connection between nurses' knowledge and perceptions regarding triage skills in the Emergency Department. The research indicated a connection between knowledge and triage abilities in nurses with a p value of 0.015, while no link was found between nurses' perceptions and triage skills, reflected by a p value of 0.063 (Huriani et al., 2022).

A total of 404 emergency nurses from 11 tertiary hospitals in northern China participated to enhance the comprehension of triage priority care and identify the factors affecting triage decision-making capability, providing a reference for future improvements in the quality of triage decision-making. Before taking on triage roles, just a quarter of participants (25.30%) were qualified. Fewer than half of emergency nurses (46.60%) indicated that they participated in the triage training program. The score for emergency nurses' ability in triage decision-making was 166.50 ± 26.90 (95 %CI 163.75, 169.24) in northern China. Gender ($P = 0.003$), case discussions ($P = 0.024$), secondary assessment ($P = 0.020$), and understanding of triage consensus ($P = 0.027$) are independent elements affecting the ability to make triage decisions (Yang et al., 2023).

2.10 Factors affecting on nurses' knowledge and perceptions on implementation of a triage system in pediatric emergency departments

Previous study AlShatarat et al. (2022) aimed to assess the triage knowledge and practices and their associated factors among emergency department nurses employed in King Fahad Medical City (KFMC), Saudi Arabia. Their results showed no significant differences in triage knowledge and practice according to participants' demographics including gender, job title, qualification, emergency nursing training, and previous training in triage. Most participants (95.9%) had access to their triage systems and the majority (53.7%) utilize triage systems on a daily basis. Half said that only professional nurses performed the triage role (46.9%). There was a significant positive relationship between triage knowledge and practice.

Conversely, a previous study by Sutriningsih et al. (2020) sought to evaluate nurses' perceptions of triage, and the findings indicated that knowledge, work experience, and

training impacted these perceptions. The element that had the greatest impact on shaping nurses' perceptions was knowledge.

Another study Tswaipe (2025) sought to evaluate the triage knowledge of nurses and related factors among nurses in the ED. The findings indicated that 79% of participants possessed a sufficient level of triage knowledge. The gender of respondents, their marital status, the level of nursing qualifications, nursing experience, and training in emergency care did not show a significant relationship with nurses' triage knowledge.

2.11 Role of health education and training on implementation of a triage system in pediatric emergency departments

A prospective observational study was carried out to assess the efficacy in risk prediction of different outcomes between specially trained triage nurses and the Manchester Triage System (MTS). The concordance in code categorization between the MTS and the experienced nurse was quite minimal. The analysis of the AUROC curve indicated that the expert nurse excelled over the MTS in every outcome. The triage nurse's expertise resulted in statistically significant improvements in admission rates, ICU admissions, and overall outcomes according to the physician's evaluation (Zeboli et al., 2024).

A quasi-experimental research design (Elassal et al., 2023) was carried out to examine how pediatric triage education impacts nurses' knowledge and attitudes in the emergency department. A targeted sampling of 50 nurses was employed. The results of this research indicated that the nurses' understanding and perspective on triage were enhanced after triage training in comparison to before the training.

Another quasi-experimental study (Faheim et al., 2019) was aimed to evaluate the effect of triage education on emergency nurses' performance in diverse emergency departments. The nurses' knowledge, practice, and attitude have been assessed using a self-administered questionnaire, triage competencies observational checklist, and nurses' attitude measuring scale. The study revealed poor nurses' triage knowledge, practice, and negative attitude for the studied nurses before triage education, compared to a significant improvement after triage educational program, with a statistically significant difference among the three-implementation phases (pre, post, and one month follow up).

2.12 Summary

Several international studies have been conducted to assess the level of nurses' knowledge and perceptions regarding the triage system and the barriers to its implementation. However, there are no studies in the West Bank regarding nurses' knowledge or perceptions of the triage system or its implementation. Furthermore, there is only one study in Palestine, which is in the Gaza Strip, concerning nurses' knowledge or perceptions of the triage system and its application. Additionally, the triage system has not been implemented in pediatric hospitals in the West Bank. The

Ministry of Health is working on evaluating and addressing the barriers to the implementation of the triage system in pediatric emergency departments.

2.13 Theoretical and operational definitions:

Theoretical definitions.

Knowledge is commonly understood as a belief that is both true and supported by evidence (Peng et al., 2023).
Perception refers to the process by which we interpret and make sense of sensory information, also encompasses how we react to this information (Schultz,2023).
Challenges are generally defined as obstacles or difficulties that require significant effort, determination, or innovative ideas to overcome (Yoon et al., 2023).

Operational definitions

- **Knowledge:** The knowledge about triage system was assessed by using specific questions from the questionnaire (Seda, 2020), the knowledge was assessed by 11 questions that were answered by using 3-points Likert scale (Yes, No, Don't know).
- **Perception:** The perception about triage system was assessed by using selected questions from the questionnaire (Seda, 2020), the perception was assessed by 11 questions that was answered by using 5-points Likert scale (Strongly disagree, Disagree, Neutral, Agree, Strongly agree).
- **Challenges**: The Challenges that may face triage system were assessed by using specific questions from the questionnaire (Seda, 2020), the Challenges were assessed by 13 questions that was answered by using 5-points Likert scale (Strongly disagree, Disagree, Neutral, Agree, Strongly agree).

The categorization of McDonald (2002) was used for the levels of knowledge out of 35 questions, perceptions, and challenges. The McDonald categorization system classifies the output of the examinations into five levels (very high, high, moderate, low, and very low) as follows: Very low < 60%, Low 60% - 69.99%, Moderate 70% - 79.99%, High 80% - 89.99%, Very high 90% - 100%

Chapter Three

Materials and Methods

The following chapter explains in details the methodology of the study, setting, purpose of study, study design, sample size, target population, inclusion and exclusion criteria, instrument, variable, administration of instruments, data analysis and ethical consideration.

3.1 Study design

A descriptive cross-sectional study design was employed to assess nurses' knowledge and perceptions regarding the implementation of a triage system in pediatric emergency departments in the southern West Bank, Palestine. The researcher chose to implement this design as it is the most suitable for describing nurses' knowledge and perceptions. This type of study was useful for gathering information on important health-related aspects of participants' knowledge at a specific point in time. It was quick, inexpensive, easy to conduct, and allowed the researcher to achieve the study objectives within a short period (Wang & Cheng, 2020). However, this design also has some limitations, including its inability to determine cause-and-effect relationships and its reliance on self-reported data, which may be subject to response bias.

3.2 Setting of the study

The study was conducted in pediatric emergency departments across the southern West Bank, which purposively included 8 hospitals from (government and private). The government hospitals involved are Beit Jala Governmental Hospital (Bethlehem) and Alia Governmental Hospital (Hebron), while the private hospitals include Caritas Baby Hospital (Bethlehem), Bethlehem Arab Society for Rehabilitation (Bethlehem), Al_Yamamah Hospital (Bethlehem), Al-Ahli Hospital (Hebron), Al-Mezan Hospital (Hebron), and the Palestinian Red Crescent Society Hospital (Hebron). These hospitals are the primary providers of pediatric care in the southern West Bank region.

3.3 Study population

The study included all nurses working in pediatric emergency departments across the southern West Bank, specifically at two cities (Bethlehem and Hebron). Nurses were selected or excluded based on the following criteria:

Inclusion Criteria:

- The participant must be a nurse working in the pediatric emergency.
- The participant must be willing to participate in the study by signing the informed consent.
- Nurses with Bachelor's degree or higher.
- Nurses with experience at least one year in pediatric ER.

Exclusion Criteria:

- Healthcare practitioners who do not work in pediatric emergency department.
- Individuals who refuse to participate or do not sign the informed consent.
- Nurses with degree less that Bachelor.
- Nurses with experience less than one year in pediatric ER.

3.4 Selection Method and sample size

The target population included all 135 nurses working in pediatric emergency departments in all governmental and private hospitals in the southern West Bank. The study used a complete survey, meaning that the researcher invited every nurse in the population to participate, so no sampling was done; this approach is also called census sampling. This method allowed for gathering data from the entire population, ensuring that the study results reflect the full group of nurses working in these settings.

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

City	Hospital	Number of nurses in pediatrics' ER department
Bethlehem	Beit Jala Governmental Hospital	30
Bethlehem	Caritas Hospital	31
Bethlehem	Bethlehem Arab Society for Rehabilitation	12
Bethlehem	Al_Yamamah Hospital	8
Hebron	Hebron Governmental Hospital	7
Hebron	Al-Ahli Hospital	20
Hebron	Red Crescent Hospital	15
Hebron	Al-Mezan Hospital	12
Total		135

3.5 Instrument of the Study

Data collection

- After obtaining ethical approval from Al-Quds University and permission from the study setting to conduct the study, the researcher received permission to meet with the nurses in the emergency departments to continue data collection. The researcher introduced themselves and explain the need and purpose of the study to the participants. Then, the participants who agree (130 out of 135) to participate in the study was informed about the study's objectives and the data collection process was explained. Consent form was taken from each participant. The researcher asked the participants to fully complete the self-administered questionnaire; data was collected during unit visits at different times by the researcher in this study during the study period from "March 2025 to May 2025." Any question before, during, or after data collection was answered by the researecher. Finally, the researcher appreciated all of the participants for their participation.
- A questionnaire adapted from Seda (2020) was used. Its content validity was assessed by an expert panel who evaluated the clarity and relevance of the items. The tool was distributed for the participants in English language without translation. The questionnaire consisted of four sections:
- The first section included the socio-demographic data of the participants, including (age, gender, marital status, educational level, graduations' university, workplace, job title, monthly income, and years of experience).
- The second section address knowledge, which consisted of 11, questions (six questions about subjective knowledge and 5 questions about objective knowledge). The answers was consisted of (yes, no, don't know). The correct answers in the objective knowledge items were recoded as 1, while incorrect and "I don't know" responses were recoded as 0. The total objective knowledge score for each respondent was then calculated by summing their responses. This total score was converted into a percentage by dividing the sum by the total number of items.

The total objective knowledge scale was computed by averaging all the percentages for the respondents that computed from the previous step. Regarding the subjective knowledge items, the answers (Yes) were re-coded to 1, the answers (No) re-coded to 2, and the answers (I don't know) re-coded to 3 in order to compute the frequencies and percentages for each answer for each respondent, and the total percentages of the total subjective knowledge were computed by averaging the percentages of all the items in this scale.

- The third section about perception in triage system was assessed by using specific questions from the questionnaire Seda (2020), the perception was assessed by 11 questions.

In regards of the items of the perceptions and challenges, the answers (Strongly disagree) re-coded to 1, the answers (Disagree) re-coded to 2, the answers (Neutral) re-coded to 3, the answers (Agree) re-coded to 4, and the answers (Strongly agree) re-coded to 5. The answers toward the opposite items in the perceptions scale were re-

coded reversely in order to compute the total degree of the scale, where the perceptions scale has two opposite items (Items number 4 and 8). The total levels of each one of the perceptions and challenges scales were computed for each respondent by averaging his answers for the items, and the overall total level of the scales (perceptions and challenges) were computed by averaging again the averages computed from the previous step. The percentage means were computed for each item and for the total levels of the perceptions and challenges by dividing the means by 5 and multiplying by 100%.

- The fourth section which's about challenges that may face triage system was assessed by using specific questions from the questionnaire Seda (2020), the Challenges was assessed by 13 questions that was answered by using (Yes, No, Don't know).
- The categorization of McDonald (2002) was used for the levels of knowledge, perceptions, and challenges. The McDonald categorization system classifies the output of the examinations into five levels (very high, high, moderate, low, and very low) as follows: Very low < 60%, Low 60% - 69.99%, Moderate 70% - 79.99%, High 80% - 89.99%, Very high 90% - 100%

3.6 Validity and Reliability of the Questionnaire

The study tool (Study Questionnaire), which was adapted from Seda (2020), was presented to a group of experts (five reviewers) for consultancy and reviewing purposes to assess its validity. Comments and suggestions were collected, and the researcher made necessary modifications based on this expert feedback to ensure the tool is valid and reliable for studying knowledge, perceptions, and challenges of nurses regarding the implementation of triage at pediatric emergency departments across the southern West Bank hospitals..

Additionally, to improve the reliability of the challenges domain, a pilot test was conducted with a subset of participants, and modifications were made based on their feedback. Alternative wording for some questions was also considered to enhance clarity and consistency. It is worth noting that the Cronbach’s alpha values reported in the original study by Seda (2020) were 0.83 for the knowledge domain, 0.75 for perception, and 0.65 for challenges. Table (1) shows the results of Cronbach's alpha coefficients.

Table (3.2): Cronbach's alpha coefficients.

Variable	Number of Items	Cronbach's alpha
Subjective Knowledge	6	0.72
Objective Knowledge	5	0.73
Perceptions	11	0.85
Challenges	13	0.82

3.7 Normality test of the Study Variables

The normality test for the study scales was conducted in order to decide which one of the parametric and the non-parametric statistical methods should be used. The results of the normality tests and the Skewness and Kurtosis coefficients were computed and are shown in the table 2:

Table (3.3): Normality tests, and Skewness and Kurtosis coefficients.

Variable/Scale	Kolmogorov-Smirnov		Shapiro-Wilk		Skewness coefficients	Kurtosis coefficients
	Statistic	P-value	Statistic	P-value		
Objective knowledge	0.157	0.000	0.928	0.000	0.011	-0.667
Perceptions	0.085	0.022	0.974	0.013	-0.053	-0.812
Challenges	0.126	0.000	0.954	0.000	0.622	1.192

The results of normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) in Table (3.3) show that all of the study variables are not normally distributed at the 0.05 level (all the P-values are less than 0.05). On the other hand, all of the Skewness and Kurtosis coefficients are in the normal range ±2, indicating that the distributions of the study variables are symmetric and near normal. In addition, the sample size in this study is large enough (N=130) so the researcher decided that the variables are not far away from the normal distribution and decided to use the needed parametric methods in the statistical analysis such as the one way ANOVA test and the Pearson correlation test.

3.8 Pilot Study

A pilot study was conducted with 15 nurses, who filled out the questionnaire before starting the full data collection as a pre-test to identify weaknesses in wording, predict the response rate, determine the actual time needed to complete the questionnaire, identify areas of ambiguity, and test the reliability and suitability of the questionnaire. The questionnaire used for the pilot study was not included in the target population after the necessary modifications were made.

3.9 Statistical management and procedures

The researcher used the statistical package for social science (SPSS) Version 22 is for conducting the data analysis and for creating the statistical results. The Descriptive statistics (Frequencies, Percentages, Means, Standard Deviations, and Percentage means) were computed to describe the demographic information and to describe the answers of the respondents toward the items of the study scales (Knowledge, Perceptions, Challenges and obstacles). The following statistical tests were used to test the study hypotheses assuming the statistical test with the P-value less than or equal 0.05 is significant:

In this study, several statistical tests were utilized to analyze the data. The Pearson correlation test was used to examine the relationships between the scales of knowledge, perceptions, and challenges. To assess differences in the means (or percentage means) of these scales based on socio-demographic and training factors, the One-way analysis of variance (One Way ANOVA) test was applied. Following the ANOVA, pairwise comparisons were conducted using the Tukey test when equal variances were assumed and the Dunnett T3 test when variances were unequal. These pairwise tests helped identify specific differences between groups within the socio-demographic factors.

3.10 Ethical and administrative considerations

Ethical approval was taken from the Research Ethical Committee at Al-Quds University and from the relevant committee at the Ministry of Health. The researcher committed to all ethical considerations required to conduct the research. The questionnaire was handed directly to the participants, and each participant in the study received a full explanation of the research purposes. They was informed that participation in the study is voluntary, and they have the right to withdraw from the study at any time. Confidentiality of the information was ensured and maintained, as their names were not used in the analysis or presentation of results. Protecting the rights of participants was a priority in this study. Any communication related to the research was conducted with honesty and transparency.

3.11 Period of the study

The study was conducted during the period from November 2024 to July 2025.

Chapter Four

Results

4.1 Introduction

In this chapter, the researcher presents an overview of the results from the statistical data analysis, which aims to answer the study questions and test the hypotheses. The findings focus on nurses' knowledge, perceptions, and challenges regarding the implementation of the triage system in pediatric emergency departments across hospitals in the southern West Bank. Data collected from the study sample were analyzed and organized according to the research objectives. The results are summarized clearly, highlighting important patterns and relationships related to the nurses' sociodemographic characteristics and their influence on the study variables. Tables and figures are used to provide a clear and comprehensive presentation of the findings.

4.2 Socio-Demographic Information

The study sample consisted of 130 nurses working in pediatric departments across the southern West Bank after excluding 5 unsuitable questionnaires. The sample included 81 females (62.3%) and 49 males (37.7%). About 60 (46%) of the nurses in the sample are from the age group (26-30 years), and about 37 (29%) are from the age group (31 years or more), while about 33 (25%) are from the age group (25 years or lower). Most of the participants have Bachelor's Degree 112 (about 86%), and also most of them are married 81 (about 62%).

The nurses forming the majority of the sample 127 (about 98%) and only 3 head of departments exist. Most of the nurses in the sample are from the monthly income group More than 2500 (106, 81.5%), and 21 (about 16%) are form the income group (2000-2500), while only 3 (2.3%) are from the income group (Less than 2000). Regarding the years of experience, 57 (43.8%) from the sample have Less than 5 years of experience, 44 (33.8%) have 5-10 years of experience, and 29 (22.3%) have more than 10 years of experience.

Regarding the graduation university and hospitals, the distribution of the participants in the sample was as the following: 6 from Alahlya (4.6%), 5 from Arab American

(3.8%), 4 from Alasrya (3.1%), 17 from Hebron university (13.1%), 66 from AlQuds university (50.8%), 3 from Alnajah (2.3%), 22 from Bethlehem (16.9%), 5 from Alahli College (3.8%), and only 2 from Other universities and institutes (Caritas and Ibn Seina) (1.5%).

On the other hand, regarding the Workplace, the distribution of the participants in the sample was as the following: 11 in Alhelal (8.5%), 30 in Beit jala (23.1%), 12 in Bethlehem Arab Society for Rehabilitation (9.2%), 19 in Alahli (14.6%), 7 in Alia Hospital (5.4%), 12 in Almeezan (9.2%), 8 in Alyamama (6.2%), and 31 in Caritas (23.8%). The results of table (4.1) show the distribution of the participants in the study sample according to their Socio Demographic Information.

Table (4.1): Socio Demographic Information (N=130)

Variable	Category	N	%
Age	up to 25 years	33	25.4%
	26-30 years	60	46.2%
	31 years or more	37	28.5%
Gender	Male	49	37.7%
	Female	81	62.3%
Marital Status	Single	49	37.7%
	Married	81	62.3%
Educational Level	Diploma	13	10.0%
	Bachelor's Degree	112	86.2%
	Postgraduate Studies	5	3.8%
Graduation University	Alahlya Univesity	6	4.6%
	Arab American	5	3.8%
	Modern University College	4	3.1%
	Hebron University	17	13.1%
	AlQuds University	66	50.8%
	Alnajah	3	2.3%
	Bethlehem University	22	16.9%
	Alahli College	5	3.8%
	Other (Caritas and Ibn Seina)	2	1.5%
Workplace	Palestinian Red Crescent Society Hospital	11	8.5%
	Beit jala Hospital	30	23.1%
	Bethlehem Arab Society for Rehabilitation	12	9.2%
	Alahli	19	14.6%
	Alia hospital	7	5.4%
	Almeezan	12	9.2%
	Alyamama	8	6.2%
	Caritas Baby Hospital	31	23.8%
Job Title	Nurse	127	97.7%
	Department Head	3	2.3%
Monthly Income	Less than 2000	3	2.3%
	2000-2500	21	16.2%
	More than 2500	106	81.5%
Years of Experience	Less than 5 years	57	43.8%
	5-10 years	44	33.8%
	More than 10 years	29	22.3%

The results intable (4.2) show the information about courses and training's that have been taken by the participants. The results exhibit that most of the participants in the sample received an orientation period about the tasks of the emergency department before starting their main works 102 (78.5%), with duration less than a month 54 (52.9%), and 1-3 months 33 (32.4%), and More than 3 months 15 (14.7%). The results also show that 78 (60%) of the participants didn't receive any courses during their works in the emergency department while 52 (40%) received such courses mostly in Hebron University and Al-Quds University 14 (about 27%), in Caritas 6 (11.5%), and in Alahli College 5 (9.6%) with duration Less than a month 18 (34.6%), and 1-3 months 13 (25%), and More than 3 months 21 (40.4%).

The results also show that most of the participants didn't receive specialized training in the triage system for children 92 (70.8%) and only 38 (29.2%) of them have received such trainings for example in Caritas 6 (15.8%) with duration Less than a month 31 (81.6%), and 1-3 months 4 (10.5%), and More than 3 months 3 (7.9%). In addition, most of the participants confirmed that they didn't receive continuous educational programs to develop their performance and stay updated on the latest in children's emergency systems 93 (71.5%).

Finally, the results showed that the triage systems that used in the hospitals as where the nurses work are: Australian Triage Scale (ATS) 13 (10.0%), Toowoomba Adult Trauma Triage Tool (TATTT) 6 (4.6%), Manchester Triage System (MTS) 19 (14.6%), and Other systems 7 (5.4%), while most of the nurses in the sample don't know what is the triage system that used in the hospitals where they work 85 (65.4%).

Table (4.2 -A): Clinical characteristics of the participants Information about Courses, Training's, and the triage systems used in the hospitals (N=130)

Question	Answer	N	%
Did you receive an orientation period about the tasks of the emergency department before starting your main work?	Yes	102	78.5%
	No	28	21.5%
If your answer is yes, specify the duration:	Less than a month	54	52.9%
	1-3 months	33	32.4%
	More than 3 months	15	14.7%
Have you received any courses during your work in the emergency department?	Yes	52	40.0%
	No	78	60.0%
If your answer is yes, specify the entity providing the course:	Caritas	6	11.5%
	Alasrya	1	1.9%
	Hebron university	1	1.9%
	Al-Quds university	7	13.5%
	Hebron university and Al-Quds university	6	11.5%
	AlQuds university and Alestishari hospital	1	1.9%
	Alnajah	1	1.9%

Table (4.2 -B): Clinical characteristics of the participants Information about Courses, Training's, and the triage systems used in the hospitals (N=130)

	Alahli College	5	9.6%
	Jothoor Establishment	2	3.8%
	Alahli Hospital	1	1.9%
	Aljameya Alarabya hospital	2	3.8%
	Other	19	36.5%
Course duration in emergency department	Less than a month	18	34.6%
	1-3 months	13	25.0%
	More than 3 months	21	40.4%
Have you received specialized training in the triage system for children?	Yes	38	29.2%
	No	92	70.8%
If your answer is yes, please specify the entity providing the course:	Caritas	6	15.8%
	Arab American	1	2.6%
	Alasrya	3	7.9%
	Hebron university	3	7.9%
	Al-Quds university	12	31.6%
	Jothoor Establishment	4	10.5%
	Alhelal Alahmar	1	2.6%
	Other	8	21.1%
Duration of training in the triage system	Less than a month	31	81.6%
	1-3 months	4	10.5%
	More than 3 months	3	7.9%
Do you receive continuous educational programs to develop your performance and stay updated on the latest in children's emergency systems?	Yes	37	28.5%
	No	93	71.5%
What triage system is used in the hospital where you work?	Australian Triage Scale (ATS)	13	10.0%
	Toowoomba Adult Trauma Triage Tool (TATTT)	6	4.6%
	Manchester Triage System (MTS)	19	14.6%
	Other	7	5.4%
	I don’t know	85	65.4%

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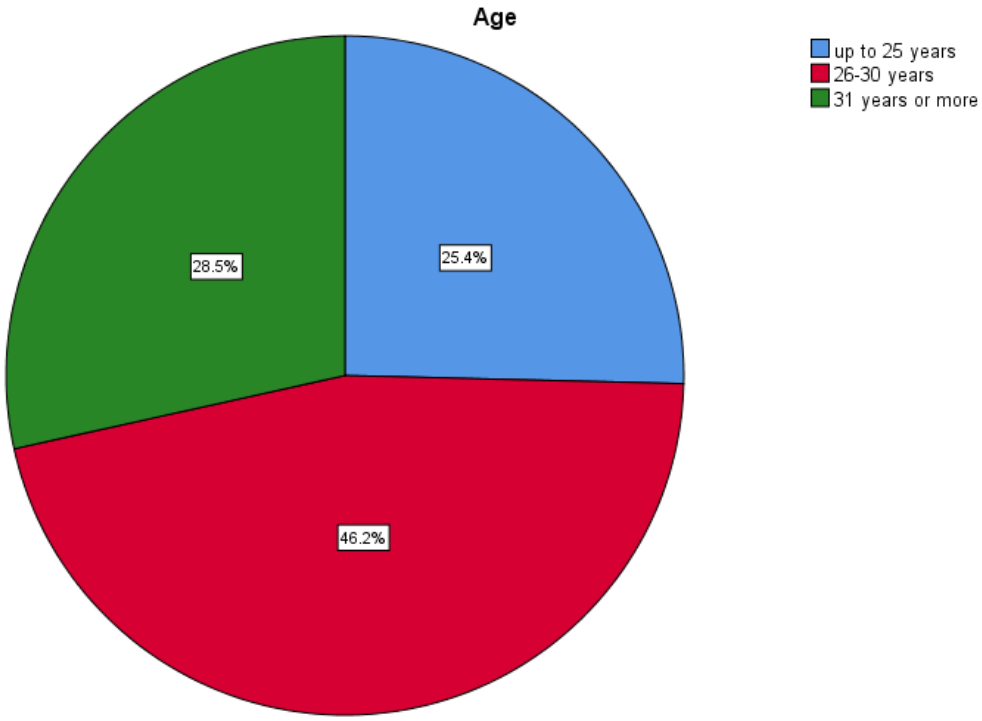
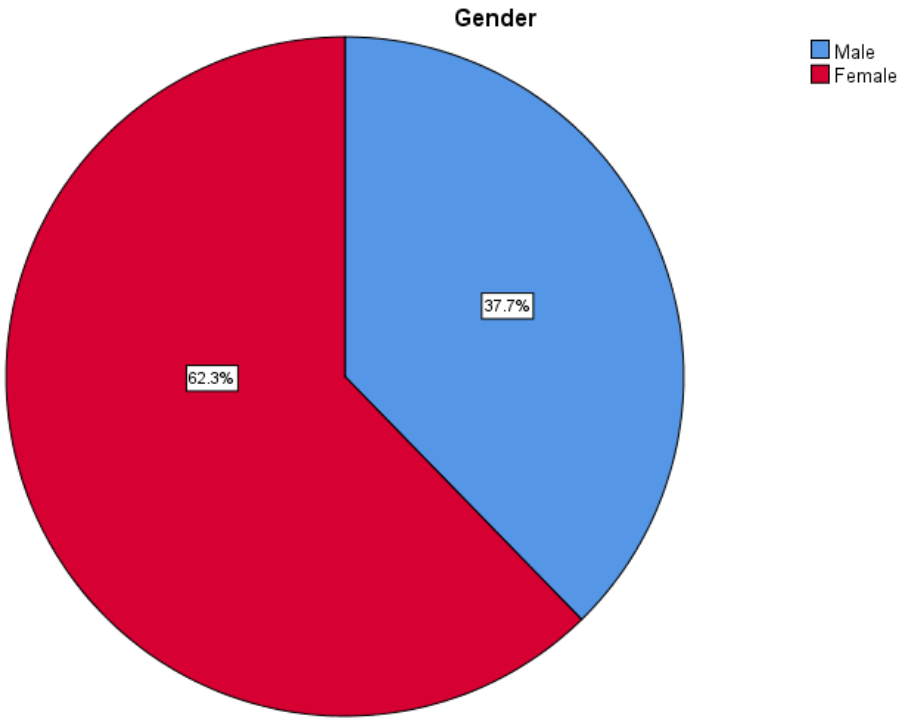


Figure 4.1: Distribution of study participants by age



.Figure 4.2: Distribution of study participants by gender

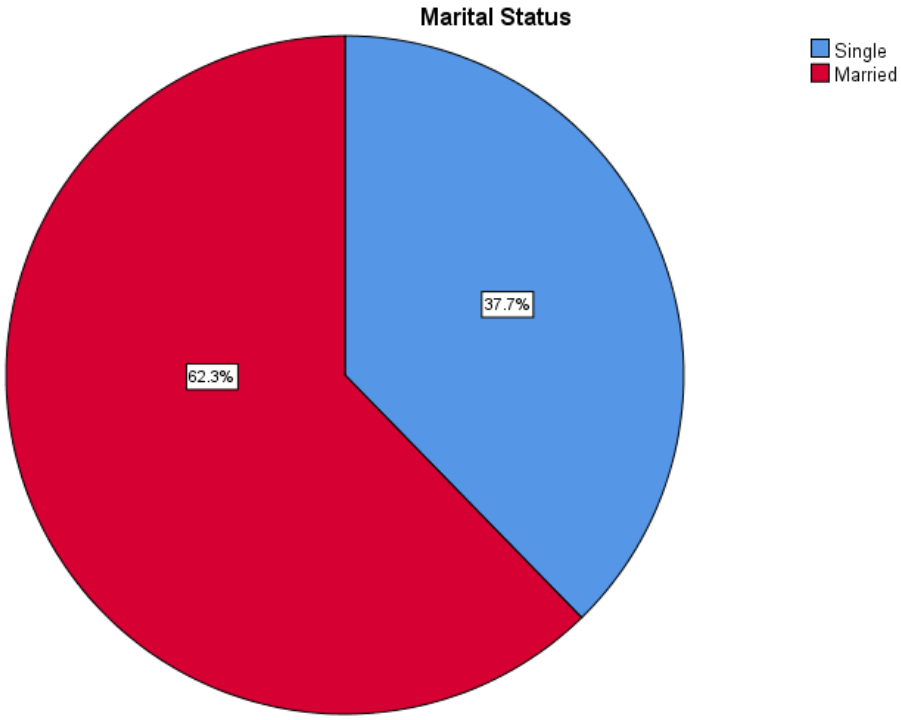


Figure 4.3: Distribution of study participants by marital status

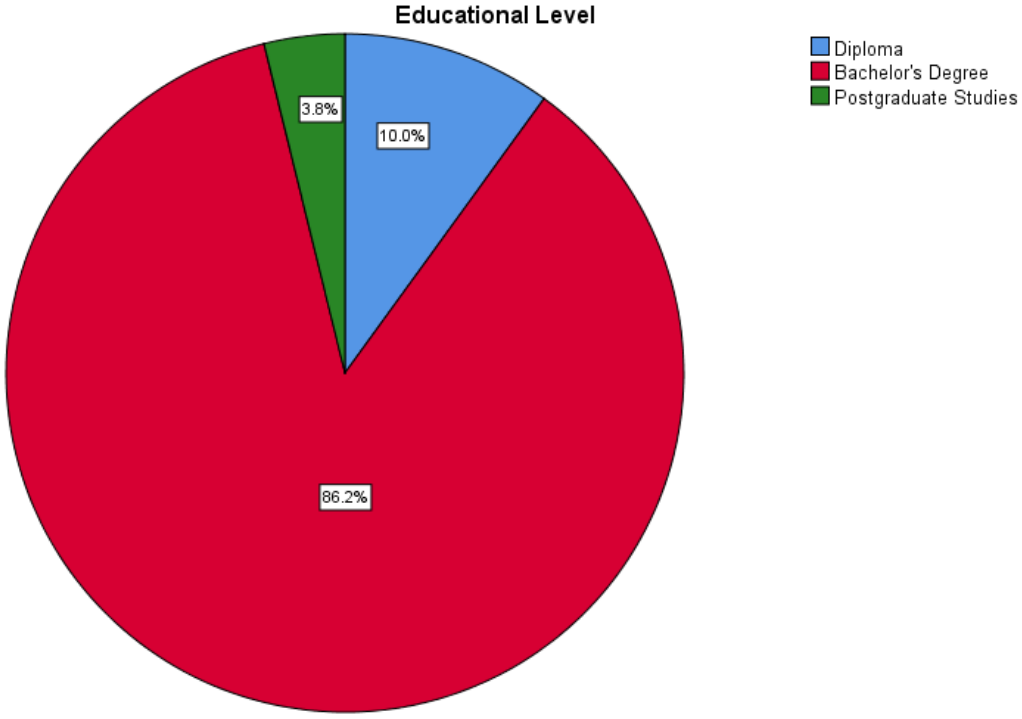
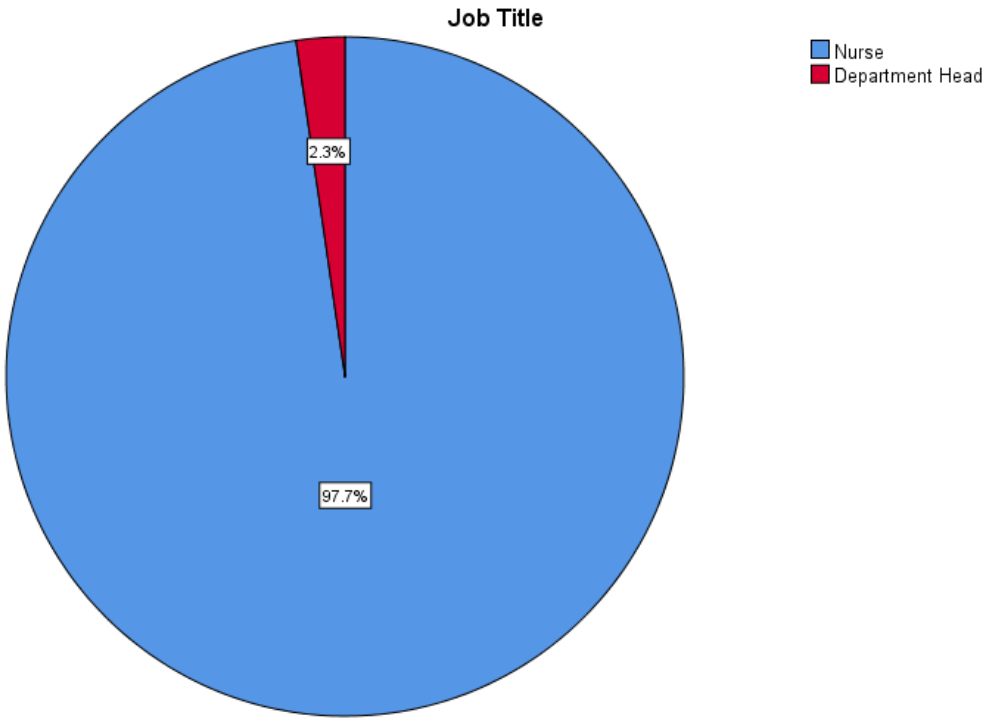


Figure 4.4 .Distribution of study participants according to educational level



.Figure 4.5: Distribution of study participants by job title

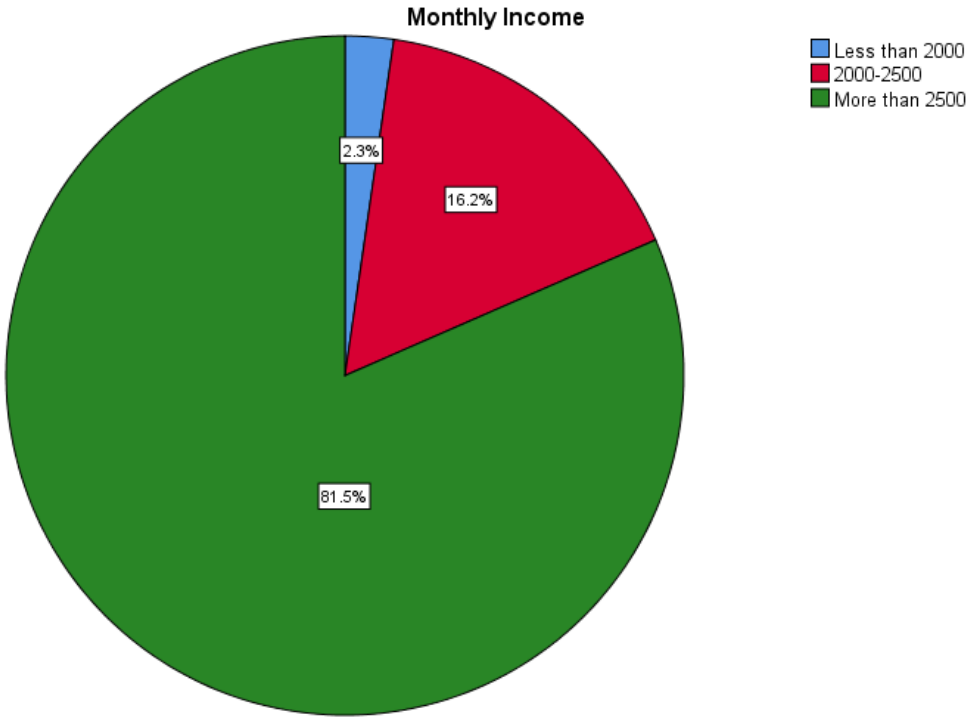


Figure 4.6: Distribution of study participants by monthly income

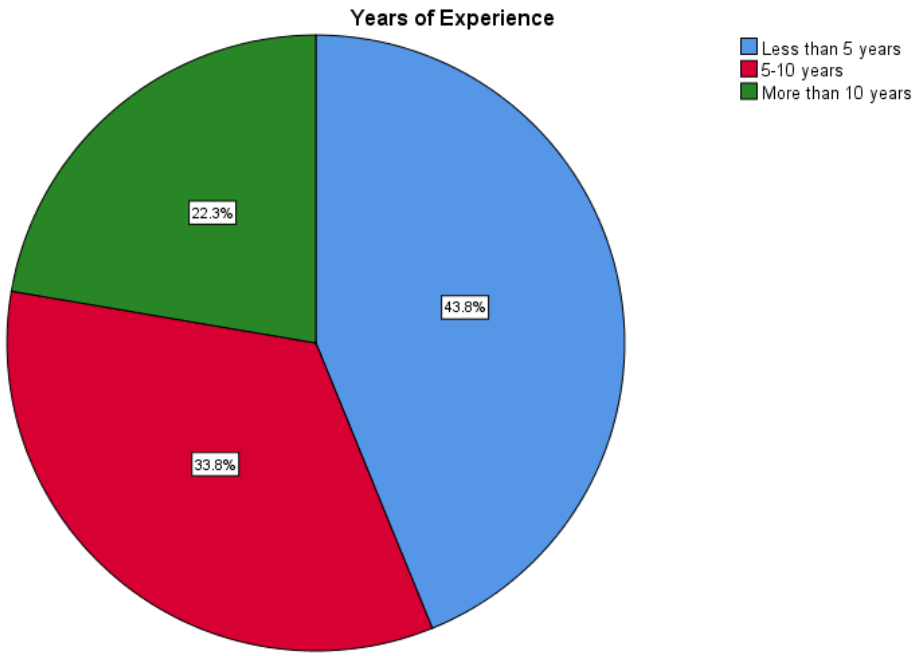


Figure 4.7 :Distribution of study participants according to years of experience.

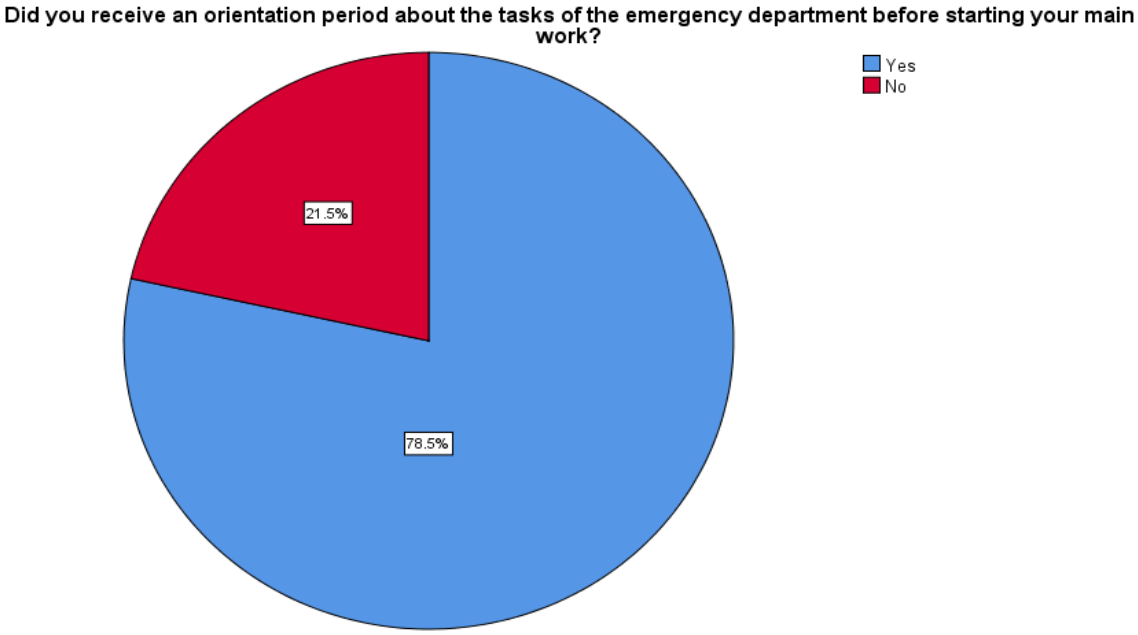


Figure 4.8: Distribution of participants in the study according to the answer to question number (10).

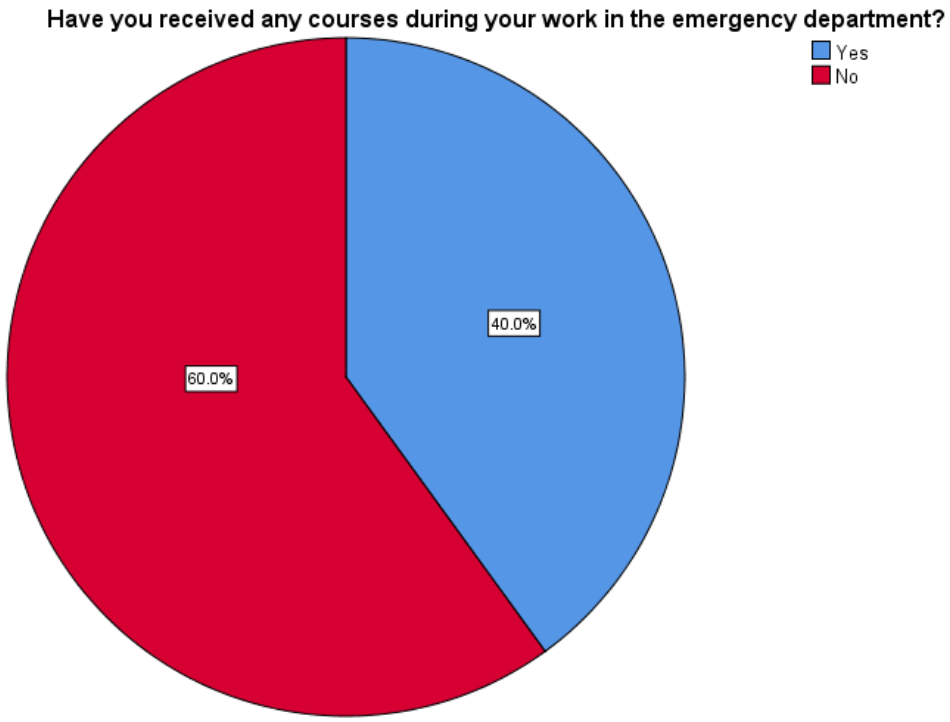


Figure 4.9: Distribution of participants in the study according to the answer to question number (12)

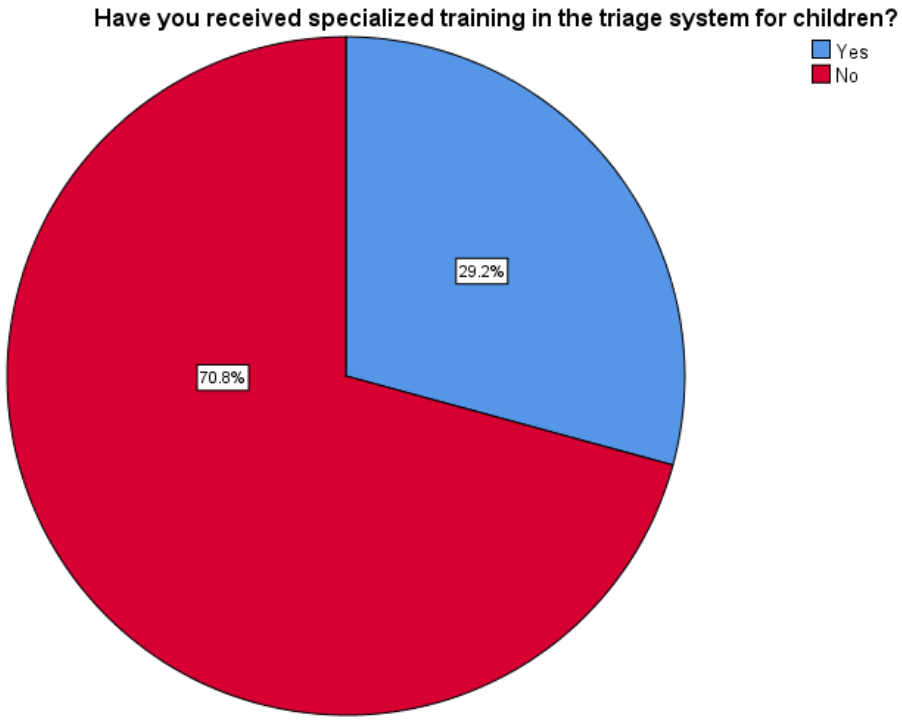


Figure 4.10: Distribution of participants in the study according to the answer to question number (15).

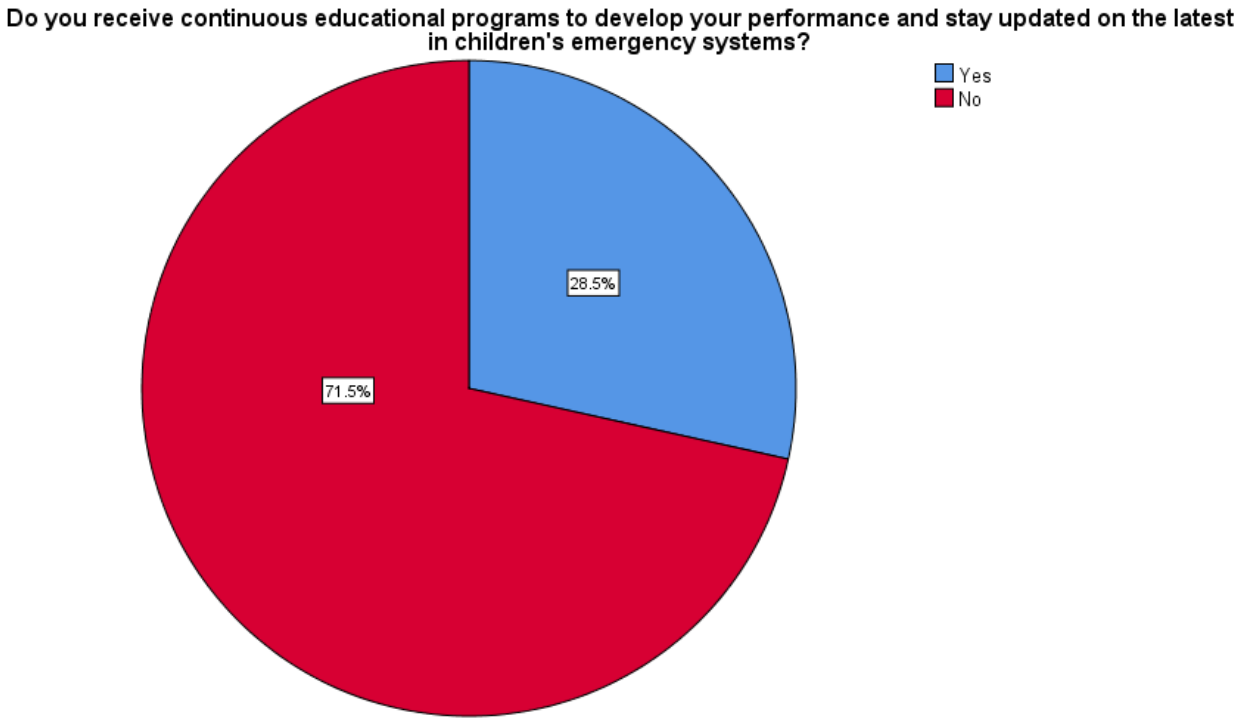


Figure 4.11: Distribution of participants in the study according to the answer to question number (18).

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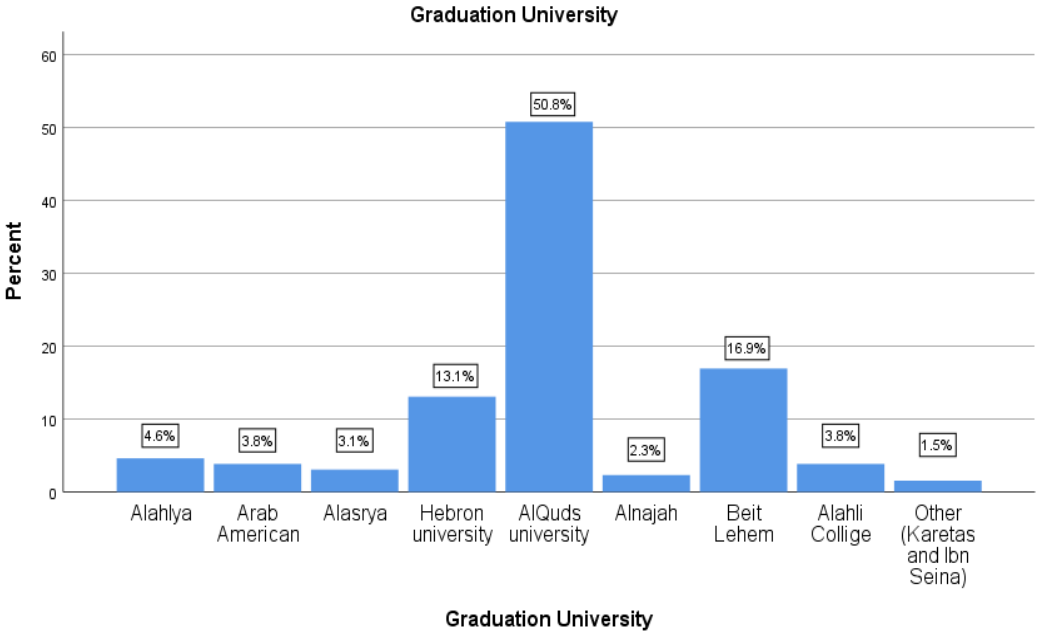

Figure 4.12: Distribution of participants in the study according to the answer to graduation university

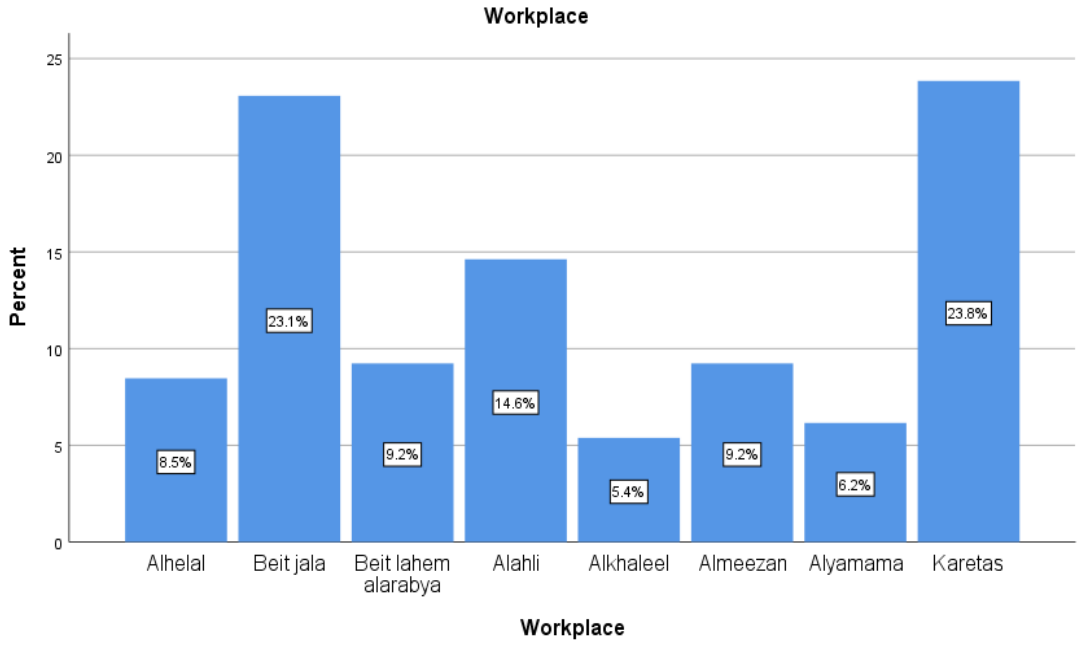

Figure 4.13: Distribution of participants in the study according to the answer to workplace.

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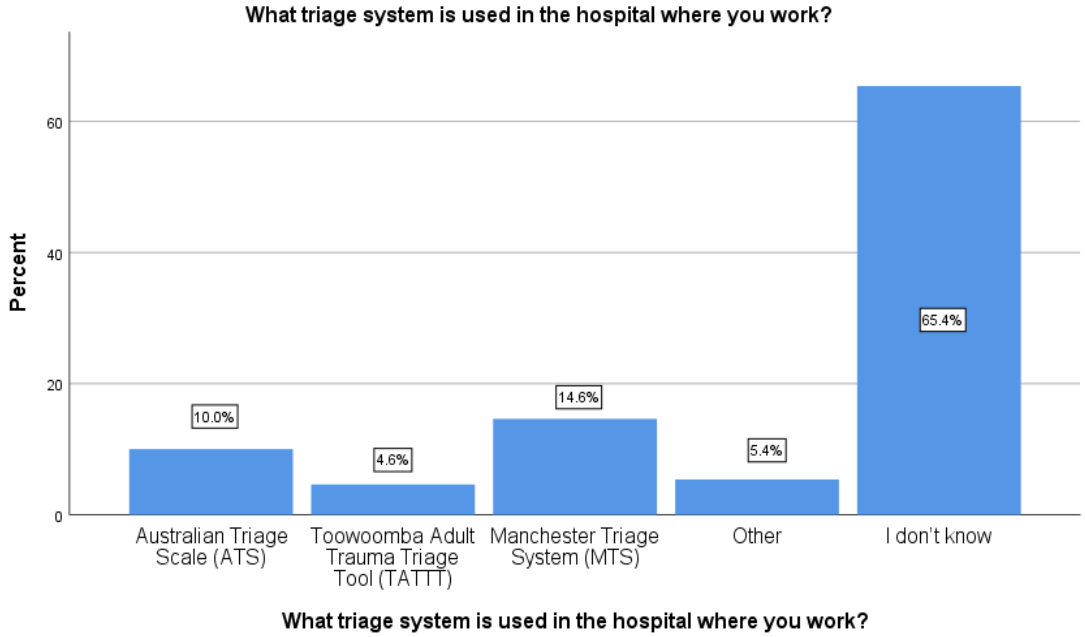

Figure 4.14: Distribution of participants in the study according to the answer to type of triage system used in their workplace

4.3 Nurses' subjective perceived knowledge about the implementation of triage.

The results in the table (4.3) show that the level of the nurses' subjective perceived knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals is 57.3% which is very low based on the McDonald (2002). The results also show that the nurses have a low subjective perceived knowledge regarding the following: they have enough knowledge about how the triage system works in the ED (63.1%), they can perform nursing tasks in the medical triage hall based on a thorough knowledge of the triage system (63.8%), and they can distinguish between the Triage system cards and the time value and priority of each (69.3%).

On the other hand, the nurses have very low subjective knowledge regarding the following: they received theoretical and practical lectures on the system of work of the triage in the ED (46.9%), they have the ability to clearly explain how the triage system works for other colleagues (48.5%), and they have full knowledge of the possible waiting time for each color individually (52.3%).

Table (4.3): The nurses' subjective perceived knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals (N=130).

Item number	subjective perceived knowledge items	Answers					
		Yes		No		Don't know	
		N	%	N	%	N	%
1	I received theoretical and practical lectures on the system of work of the triage in the ED	61	46.9%	63	48.5%	6	4.6%
2	I have enough knowledge about how the triage system works in the ED	82	63.1%	39	30.0%	9	6.9%
3	I have the ability to clearly explain how the triage system works for other colleagues	63	48.5%	45	34.6%	22	16.9%
4	I can perform nursing tasks in the medical triage hall based on a thorough knowledge of the triage system	83	63.8%	38	29.3%	9	6.9%
5	I can distinguish between the Triage system cards and the time value and priority of each	90	69.3%	28	21.5%	12	9.2%
6	I have full knowledge of the possible waiting time for each color individually	68	52.3%	35	26.9%	27	20.8%
Total subjective perceived knowledge (Average)		75	57.3%	41	31.8%	14	10.9%

4.4 Nurses' objective knowledge about the implementation of triage.

The results in table (4.4) show that the level of the nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals is very low with mean (S.D) 45.2 (28.2) and the percentage of the correct answers is 45.2%.

The results also show that the nurses have a moderate knowledge regarding whether the patient with the red card can wait up to an hour for medical care or not (73.8%), and they have low knowledge regarding whether the patient with the green card needs urgent and immediate medical intervention (64.6%).

On the other hand, the nurses have very low objective knowledge regarding the following items: The Triage system is based on sorting cases with different color cards globally agreed upon (30.8%), A yellow card patient can wait up to three hours for medical care (27.7%), The patient with the black card does not require medical care or intervention (29.2%).

Table (4.4): The nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals (N=130).

Item No.	Objective knowledge items	Correct Answers		Mean (S.D)	Level
		N	%		
7	The Triage system is based on sorting cases with different color cards globally agreed upon	40	30.8%	30.8 (46.3)	Very low
8	The patient with the red card can wait up to an hour for medical care	96	73.8%	73.8 (44.1)	Moderate
9	A yellow card patient can wait up to three hours for medical care	36	27.7%	27.7 (44.9)	Very low
10	The patient with the black card does not require medical care or intervention	38	29.2%	29.2 (45.7)	Very low
11	The patient with the green card needs urgent and immediate medical intervention	84	64.6%	64.6 (48)	low
Total objective knowledge (Average)		59	45.2%	45.2 (28.2)	Very low

4.5 Comparisons between the subjective and the objective knowledge.

The results in tables 4.3 and 4.4 show that there may be a difference between the nurses' subjective perceived knowledge (57.3%) and their objective knowledge (45.2%) about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals(the subjective perceived knowledge is higher than the objective knowledge), but both of them are very low. On the other hand, the Pearson correlation between the total scale of the subjective knowledge and the total scale of the objective knowledge was computed and it is 0.166 which is very low and not significant (P-value=0.060) indicating that there is no relationship between the

subjective perceived knowledge and the objective knowledge for the nurses (Table 4.5).

Table (4.5): Pearson correlations between the total subjective knowledge and the total objective knowledge (N=130).

		Total subjective knowledge	Total objective knowledge
Total subjective knowledge	Pearson Correlation	1	0.166
	P-value		0.060
Total objective knowledge	Pearson Correlation	0.166	1
	P-value	0.060	

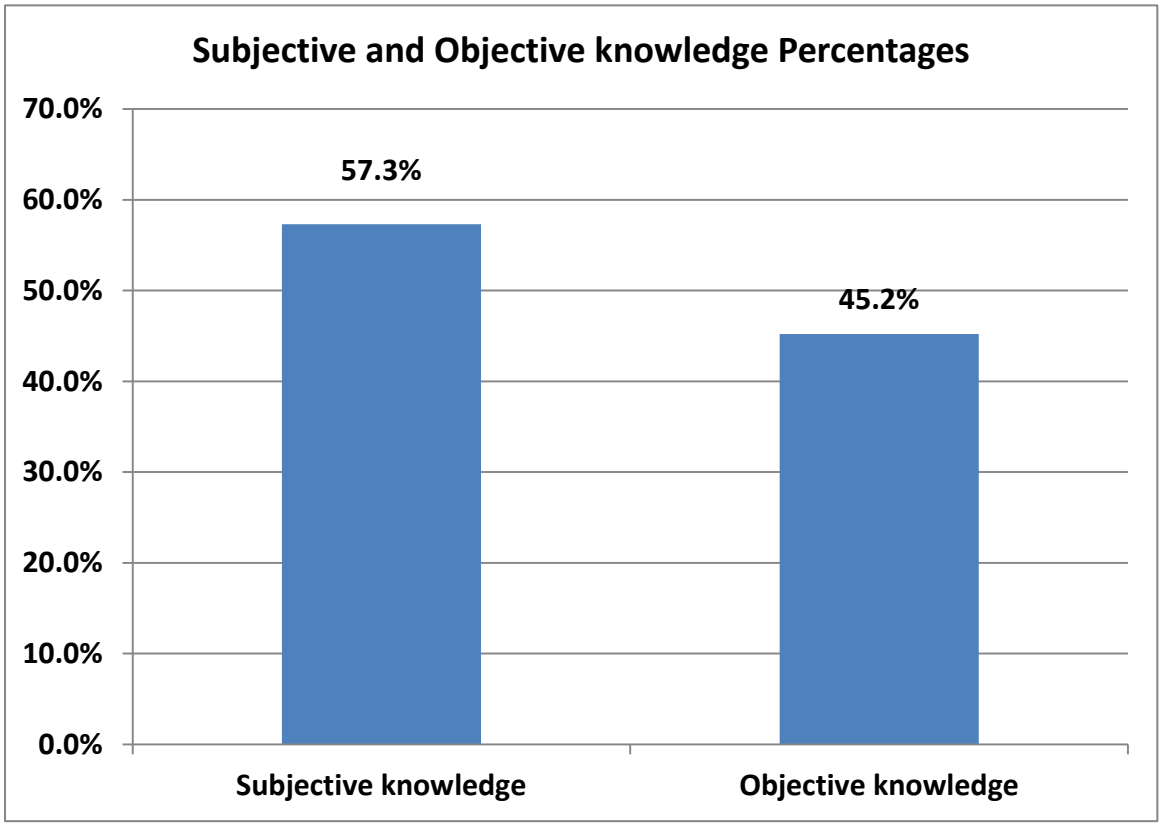

Figure (4.15): Distribution of participants in the study according to the subjective and objective knowledge percentages.

4.6 Nurses' perceptions about the implementation of triage.

The results in table (4.6) show that the level of nurses' perceptions about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals is positive, the mean of their perceptions is 4.06 (SD=0.43) and the percentage Average is (81.2%).

The results also show that the nurses perceptions were high regarding the following : The Triage system affects the quality of healthcare in EDs significantly (89.7%), Triage system is one of the foundations of patient safety in ED (88.0%), the nurses

believe in the importance of the role of the nurse in the application of the Triage system in the ED (88.0%).

Also, they would like to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED (87.7%), The Triage system is an effective way of dealing with congestion in the ED (87.2%), the nurses believe in the key role of the Triage system in providing emergency health care in the pediatric ED as a priority (86.0%),

In addition, they are convinced of the need to activate the Triage system in the management of cases at ED overcrowding (86.0%), also they think that the basis of the Triage system is based on the optimal utilization of capabilities (85.1%), and also the think that the Triage plays a major role in reaching patients and their families (84.5%). The results also show that the nurses have moderate perceptions toward that the implementation of the Triage system needs huge supplies and efforts (70.3%).

On the other hand, the results show that the nurses have very low perceptions regarding that Nursing and medical staff can control the overcrowding of cases in the emergency department without activating the triage system (58.9%).

Table (4.6-A): The nurses' perceptions about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals (N=130).

Item No.	Perceptions Items	Mean	Standard Deviation	Percentage Mean	Level
1.	The Triage system affects the quality of healthcare in EDs significantly	4.48	0.78	89.7%	High
2.	Triage plays a major role in reaching patients and their families	4.22	0.80	84.5%	High
3.	The basis of the Triage system is based on the optimal utilization of capabilities	4.25	0.71	85.1%	High
4.	The implementation of the Triage system needs huge supplies and efforts	3.52	0.86	70.3%	Moderate
5.	Triage system is one of the foundations of patient safety in ED	4.40	0.62	88.0%	High
6.	The Triage system is an effective way of dealing with congestion in the ED	4.36	0.68	87.2%	High
7.	I believe in the importance of the role of the nurse in the application of the Triage system in the ED	4.40	0.68	88.0%	High
8.	Nursing and medical staff can control the overcrowding of cases in the emergency department without activating the triage system	2.95	1.25	58.9%	Very low
9.	I believe in the key role of the Triage system in providing emergency health care in the pediatric ED as a priority	4.30	0.64	86.0%	High

Table (4.6-A): The nurses' perceptions about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals (N=130).

10.	I would like to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED	4.38	0.79	87.7%	High
11.	We are convinced of the need to activate the Triage system in the management of cases at ED overcrowding	4.30	0.81	86.0%	High
	Total Level of Perceptions	4.06	0.43	81.2%	High

4.7 Nurses' Barriers and challenges during the implementation of the triage.

The results in table (4.7) show that the level of the total degree of the challenges that encounter the nurses when implementing triage in pediatric emergency departments across the southern West Bank hospitals is low, the mean is (3.35 (0.55) and the percentage mean is (66.9%).

The results show that the highest challenges that encounter the nurses when implementing triage in pediatric emergency departments across the southern West Bank hospitals are: they do not believe that the public has sufficient awareness regarding the mechanism of the triage system (74.0%), there seems to be no real public interest or desire for the implementation of the triage system (72.3%), they believe that there are significant challenges and obstacles that will hinder the implementation of the triage system in the pediatric emergency department (72.2%).

Also, there are no enough educational signs in the waiting area to inform the public about how the triage system works (69.5%), the workload pressure in the emergency department hinders the successful implementation of the triage system (68.9%), and it is not appear and no clear conviction or genuine willingness among decision-makers to implement the triage system (68.2%).

On the other hand, the lowest challenges are: there are no security personnel available in the waiting area to manage disorder, which negatively affects the ability to adhere to the time constraints of the triage system (67.4%), the current nursing staff the departments are insufficient to implement the triage system (65.8%).

Also, nurses do not have enough time to implement the triage system in the pediatric emergency department (65.8%), patients overcrowding is one of the obstacles to implementing the triage system (65.2%), the departments do not have adequate financial resources to implement the triage system easily and without hindrance (61.1%),

The lowest challenges are: the nursing staff lacks genuine motivation to implement the triage system (60.0%), and the work environment is unsuitable and inadequate for the effective implementation of the triage system (59.7%).

Table (4.7): The challenges that encounter the nurses when implementing triage in pediatric emergency departments across the southern West Bank hospitals (N=130).

Item No.	The Barriers and Challenges Items	Mean	Standard Deviation	Percentage Mean	Level
1.	I believe there are significant challenges and obstacles that will hinder the implementation of the triage system in the pediatric emergency department.	3.61	0.86	72.2%	Moderate
2.	The work environment is unsuitable and inadequate for the effective implementation of the triage system.	2.98	0.98	59.7%	Very low
3.	There does not appear to be a clear conviction or genuine willingness among decision-makers to implement the triage system.	3.41	0.95	68.2%	Low
4.	The current nursing staff in my department is insufficient to implement the triage system.	3.29	1.08	65.8%	Low
5.	The nursing staff lacks genuine motivation to implement the triage system.	3.00	1.17	60.0%	Low
6.	Patient overcrowding is one of the obstacles to implementing the triage system.	3.26	1.19	65.2%	Low
7.	I do not believe that the public has sufficient awareness regarding the mechanism of the triage system.	3.70	1.00	74.0%	Moderate
8.	There seems to be no real public interest or desire for the implementation of the triage system.	3.62	0.88	72.3%	Moderate
9.	The department does not have adequate financial resources to implement the triage system easily and without hindrance.	3.05	0.93	61.1%	Low
10.	There are no security personnel available in the waiting area to manage disorder, which negatively affects the ability to adhere to the time constraints of the triage system.	3.37	1.00	67.4%	Low
11.	There are not enough educational signs in the waiting area to inform the public about how the triage system works.	3.48	1.21	69.5%	Low
12.	Nurses do not have enough time to implement the triage system in the pediatric emergency department.	3.29	0.95	65.8%	Low
13.	Workload pressure in the emergency department hinders the successful implementation of the triage system.	3.45	1.19	68.9%	Low
	Total Level of Challenges	3.35	0.55	66.9%	Low

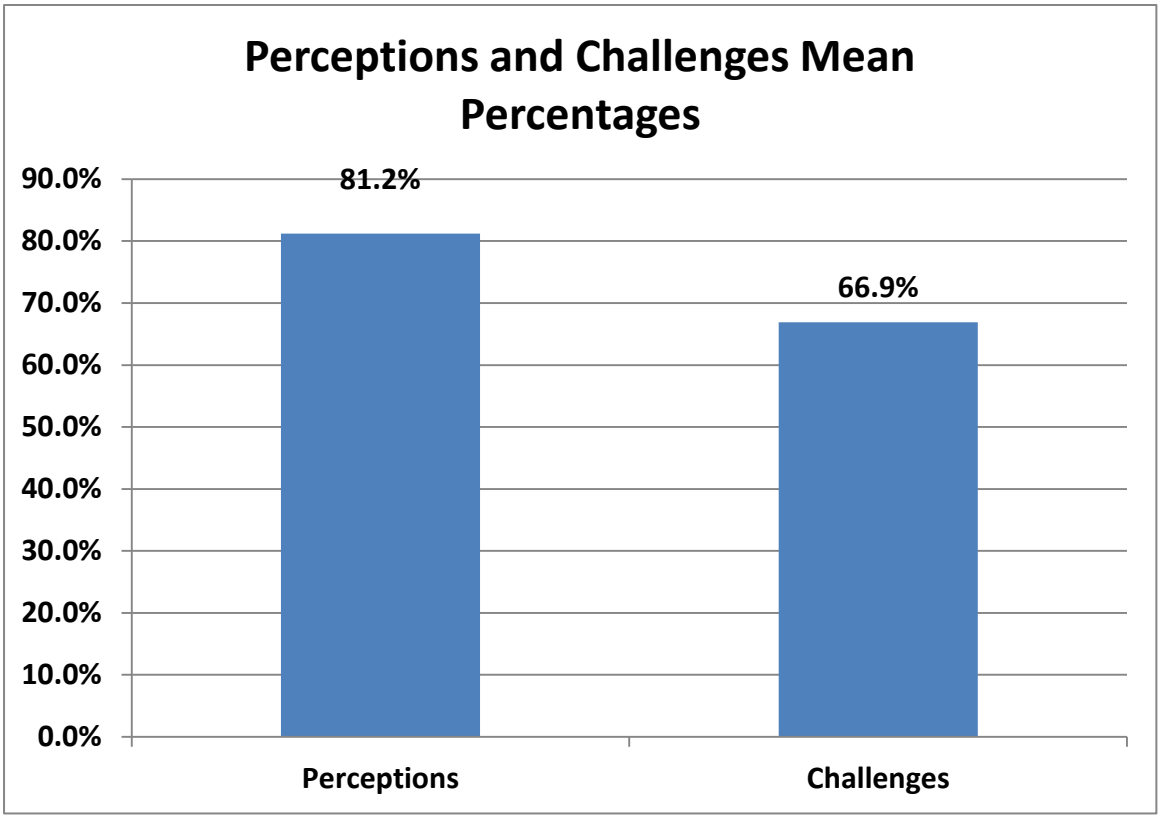

Figure (4.16): Distribution of participants in the study according to the perceptions and challenges mean percentages

Study Hypotheses

In what follows, the researcher introduces the analysis of the study hypotheses based on the data analysis from the study sample.

H1) There is no significant correlation at the level of (α = 0.05) between nurses' knowledge and their perceptions toward triage implementation in pediatric emergency departments across the southern West Bank hospitals.

The results in table (4.8) show that there is significant positive correlation at the level of (α = 0.05) between nurses' knowledge and their perceptions toward triage implementation in pediatric emergency departments across the southern West Bank hospitals, the p-value of the correlation test is less than 0.05 (p-value =0.000), and the Pearson correlation coefficient is positive (r=0.307) indicating that the increase of the nurses' knowledge increases their perceptions toward triage implementation in pediatric emergency departments across the southern West Bank hospitals. Based on the results of table (4.8), the null hypothesis **H1** is rejected.

Table (4.8): Pearson Correlations between nurses' knowledge, perceptions, and challenges toward triage implementation in pediatric emergency departments across the southern West Bank hospitals.

		knowledge	perceptions	challenges
knowledge	Pearson Correlation	1	0.307*	0.057
	P-value		0.001	0.517
perceptions	Pearson Correlation	0.307*	1	-0.328*
	P-value	0.001		0.001
challenges	Pearson Correlation	0.057	-0.328*	1
	P-value	0.517	0.001	

* Correlation is significant at the 0.05 level.

H2) There is no significant correlation at the level of (α = 0.05) between nurses' knowledge and their challenges about triage implementation in pediatric emergency departments across the southern West Bank hospitals.

The results in table (4.8) show that there is no significant correlation at the level of (α = 0.05) between nurses' knowledge and their challenges about triage implementation in pediatric emergency departments across the southern West Bank hospitals, the p-value of the correlation test is higher than 0.05 (p-value =0.517), and the Pearson correlation coefficient is very low (r=0.057). Based on the results of table (4.8), the null hypothesis **H2** cannot be rejected.

H3) There is no significant correlation at the level of (α = 0.05) between nurses' perceptions and their challenges about triage implementation in pediatric emergency departments across the southern West Bank hospitals.

The results in table (4.8) show that there is significant negative correlation at the level of (α = 0.05) between nurses' perceptions and their challenges about triage implementation in pediatric emergency departments across the southern West Bank hospitals, the p-value of the correlation test is less than 0.05 (p-value =0.001), and the Pearson correlation coefficient is negative (r=-0.328) indicating that the increase of the nurses' perceptions decreases their challenges about triage implementation in pediatric emergency departments across the southern West Bank hospitals. Based on the results of table (4.8), the null hypothesis **H3** is rejected.

H4) there are no significant relationships at the level of (α = 0.05) between the nurses' knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals and their socio demographic factors and the clinical characteristics.

The researcher used the one way analysis of variance (One Way ANOVA) and the independent samples T-tests to test the differences in the nurses' objective knowledge due to the socio demographic factors. Table (4.9) shows the results.

Table (4.9-A): Association between the socio-demographic, clinical characteristics and nurse's knowledge level.

Factor	Category	N	Mean	Standard Deviation	F or T (P-value)
Age	up to 25 years	33	45.45	24.63	0.137 (0.872)
	26-30 years	60	46.33	32.83	
	31 years or more	37	43.24	23.34	
Gender	Male	49	40.41	29.86	1.522 (0.13)
	Female	81	48.15	26.98	
Marital Status	Single	49	55.92	26.45	3.5 (0.001)*
	Married	81	38.77	27.45	
Educational Level	Diploma	13	43.08	26.89	2.399 (0.095)
	Bachelor's Degree	112	44.29	28.34	
	Postgraduate Studies	5	72.00	17.89	
Graduation University	Alahlya	6	63.33	23.38	2.402 (0.019)*
	Arab American	5	68.00	10.95	
	Alasrya	4	20.00	23.09	
	Hebron university	17	32.94	25.44	
	AlQuds university	66	47.58	28.88	
	Alnajah	3	73.33	30.55	
	Beit Lehem	22	39.09	28.60	
	Alahli College	5	36.00	8.94	
	Other (Karetas and Ibn Seina)	2	60.00	0.00	
Workplace	Alhelal	11	58.18	28.92	0.747 (0.633)
	Beit jala	30	42.67	29.59	
	Beit lahem alarabya	12	48.33	33.53	
	Alahli	19	44.21	29.50	
	Alkhaleel	7	40.00	0.00	
	Almeezan	12	55.00	17.32	
	Alyamama	8	42.50	31.05	
	Karetas	31	40.65	29.88	
Job Title	Nurse	127	44.57	28.08	1.758 (0.081)
	Department Head	3	73.33	23.09	
Monthly Income	Less than 2000	3	0.00	0.00	4.315 (0.015)*
	2000-2500	21	49.52	32.01	
	More than 2500	106	45.66	26.87	
Years of Experience	Less than 5 years	57	48.77	31.40	0.881 (0.417)
	5-10 years	44	41.36	29.70	
	More than 10 years	29	44.14	17.22	

Table (4.9-B): Association between the socio-demographic, clinical characteristics and nurse's knowledge level.

Receiving orientation period	Yes	102	47.25	27.26	1.569 (0.119)
	No	28	37.86	30.95	
Receiving courses	Yes	52	50.00	29.24	1.581 (0.116)
	No	78	42.05	27.27	
Receiving specialized training in triage system	Yes	38	42.63	28.35	0.673 (0.502)
	No	92	46.30	28.27	
Receiving continuous educational programs	Yes	37	42.70	29.50	0.642 (0.522)
	No	93	46.24	27.82	
Triage system used in the hospital	Australian Triage Scale (ATS)	13	44.62	20.25	0.245 (0.912)
	Toowoomba Adult Trauma Triage Tool (TATTT)	6	50.00	27.57	
	Manchester Triage System (MTS)	19	45.26	28.94	
	Other	7	54.29	9.76	
	I don’t know	85	44.24	30.41	

* The test is significant at the 0.05 level.

The results in the table (4.9) show that there are statistically significant differences at the level of 0.05 in the nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals due to Marital Status, the results of T-test show that the p-value of the test is 0.001, and the results show that the single nurses have mean of knowledge (Mean=55.92%) significantly higher than the mean of knowledge of the married nurses (Mean=38.77%).

The results in the table (4.9) show that there are statistically significant differences at the level of 0.05 in the nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals due to the Graduation University, the p-value of the test is 0.019, and the results of Dunnett pairwise comparison tests (Table 4.10) revealed significant differences in nurses' knowledge based on their university of graduation. Nurses who graduated

from Arab American University, Caritas, and Ibn Seina University demonstrated higher knowledge levels, with mean scores ranging from 60% to 68%. In contrast, nurses from Hebron University, Bethlehem University, Alahli College, and Al-Quds University had lower knowledge scores, with means between 32.94% and 47.58%. Overall, graduates from Al-Najah, Arab American, Alahliya, and other institutions such as Caritas and Ibn Seina showed knowledge levels between 60% and 73.33%, which were significantly higher than those from Al-Quds University, Bethlehem University, Alahli College, Hebron University, and Al-Asriya University, whose means ranged from 20% to 47.58%.

Finally, the results in the table (4.9) show that there are statistically significant differences at the level of 0.05 in the nurses' objective knowledge about the implementation of triage at pediatric emergency departments across the southern West Bank hospitals due to the monthly income, the p-value of the test is 0.015, and the results of Dunnett pairwise comparisons tests in the table (4.10) show that the means of the knowledge of nurses form the monthly income groups (More than 2500, Mean=45.66%) and (2000-2500, Mean=49.52%) are significantly higher than the mean of the knowledge of nurses form the monthly income group (Less than 2000, Mean=0.00%) who have zero knowledge.

Based on the previous results, the researcher rejected the null hypothesis H4 only regarding the factors (Marital Status, Graduation University, and Monthly Income).

Table (4.10-A): Dunnett T3 Pairwise Comparisons for differences in the nurses' objective knowledge based on the graduation university and the monthly income.

Graduation University (I)	Graduation University (J)	Mean Difference (I-J)	Std. Error	P-value
Arab American	Alahlya	4.667	10.729	1.000
	Alasrya	48.000	12.543	0.193
	Hebron university	35.059*	7.878	0.012*
	AlQuds university	20.424	6.053	0.158
	Alnajah	-5.333	18.306	1.000
	Beit Lehem	28.909*	7.822	0.049*
	Alahli College	32.000*	6.325	0.024*
	Other (Karetas and Ibn Seina)	8.000	4.899	0.886

Table (4.10-B): Dunnett T3 Pairwise Comparisons for differences in the nurses' objective knowledge based on the graduation university and the monthly income.

Other (Karetas and Ibn Seina)	Alahlya	-3.333	9.545	1.000
	Arab American	-8.000	4.899	0.886
	Alasrya	40.000	11.547	0.306
	Hebron university	27.059*	6.169	0.014*
	AlQuds university	12.424*	3.555	0.030*
	Alnajah	-13.333	17.638	0.999
	Beit Lehem	20.909	6.098	0.075
	Alahli College	24.000*	4.000	0.047*
Monthly Income (I)	Monthly Income (J)	Mean Difference (I-J)	Std. Error	P-value
Less than 2000	2000-2500	-49.524*	6.98557	0.000*
	More than 2500	-45.6604*	2.60974	0.000*
2000-2500	Less than 2000	49.524*	6.98557	0.000*
	More than 2500	3.863	7.45714	0.937
More than 2500	Less than 2000	45.660*	2.60974	0.000*
	2000-2500	-3.863	7.45714	0.937

* The mean difference is significant at the 0.05 level.

H5) there are no significant relationships at the level of ($\alpha = 0.05$) between the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals and their socio demographic factors and the clinical characteristics.

The researcher used the one way analysis of variance (One Way ANOVA) and the independent samples T-tests to test the differences in the nurses' perceptions due to the socio demographic factors. Table 4.11 shows the results.

Table (4.11-A): Association between the socio-demographic, clinical characteristics and nurse's perceptions level.

Factor	Category	N	Mean	Standard Deviation	F or T (P-value)
Age	up to 25 years	33	82.81	8.44	6.864 (0.001)*
	26-30 years	60	82.91	7.23	
	31 years or more	37	76.90	9.67	
Gender	Male	49	80.74	8.17	0.442 (0.659)
	Female	81	81.44	8.98	
Marital Status	Single	49	82.97	8.65	1.854 (0.066)
	Married	81	80.09	8.53	
Educational Level	Diploma	13	76.92	7.80	2.405 (0.094)
	Bachelor's Degree	112	81.83	8.70	
	Postgraduate Studies	5	77.45	6.88	
Graduation University	Alahlya	6	81.21	8.10	4.12 (0.000)*
	Arab American	5	92.00	3.98	
	Alasrya	4	77.27	5.25	
	Hebron university	17	77.43	10.83	
	AlQuds university	66	82.18	7.94	
	Alnajah	3	93.33	2.78	
	Beit Lehem	22	80.08	7.09	
	Alahli College	5	69.82	3.98	
	Other (Karetas and Ibn Seina)	2	82.73	3.86	
Workplace	Alhelal	11	77.36	8.43	2.201 (0.039)*
	Beit jala	30	81.94	9.52	
	Beit lahem alarabya	12	81.21	8.14	
	Alahli	19	75.89	10.74	
	Alkhaleel	7	83.64	6.80	
	Almeezan	12	85.61	7.04	
	Alyamama	8	84.32	2.56	
	Karetas	31	81.94	7.24	
Job Title	Nurse	127	81.23	8.58	0.481 (0.631)
	Department Head	3	78.79	13.65	
Monthly Income	Less than 2000	3	63.64	0.00	7.734 (0.001)*
	2000-2500	21	83.64	8.76	
	More than 2500	106	81.18	8.22	
Years of Experience	Less than 5 years	57	83.22	8.22	3.945 (0.022)*
	5-10 years	44	80.70	8.42	
	More than 10 years	29	77.87	9.01	
Receiving orientation period	Yes	102	81.75	8.00	1.444 (0.151)
	No	28	79.09	10.64	
Receiving courses	Yes	52	81.82	9.46	0.691 (0.491)
	No	78	80.75	8.11	

Table (4.11-B): Association between the socio-demographic, clinical characteristics and nurse's perceptions level.

Receiving specialized training in triage system	Yes	38	80.67	7.52	0.425 (0.671)
	No	92	81.38	9.12	
Receiving continuous educational programs	Yes	37	79.85	8.20	1.099 (0.274)
	No	93	81.70	8.82	
Triage system used in the hospital	Australian Triage Scale (ATS)	13	80.00	11.78	0.466 (0.761)
	Toowoomba Adult Trauma Triage Tool (TATTT)	6	84.85	5.71	
	Manchester Triage System (MTS)	19	79.90	6.54	
	Other	7	80.26	5.08	
	I don’t know	85	81.45	8.98	

* The test is significant at the 0.05 level.

The results in the table (4.11) show that there are statistically significant differences at the level of 0.05 in the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to Age,The p-value of the test was 0.001, indicating a statistically significant difference between groups. The Tukey pairwise comparison tests shown in Table 4.12 revealed that nurses in the younger age groups (up to 25 years, Mean = 82.81%, and 26–30 years, Mean = 82.91%) have significantly higher perception scores compared to nurses aged 31 years or older (Mean = 76.90%). This suggests that younger nurses tend to have more positive perceptions regarding the studied topic, which may reflect differences in recent training, adaptability, or exposure to current practices.

The results in the table (4.11) show that there are statistically significant differences at the level of 0.05 in the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the Graduation University, the p-value of the test is 0.000, and the results of Tukey pairwise comparisons tests in the table (4.12) show that the mean values of the perceptions of nurses who graduated from the universities (Arab American, AlQuds university Alnajah; the Means respectively: 92%, 82.18%, 93.33%) are generally higher than the means of the perceptions of nurses who graduated from the universities (Hebron university, Alahli College; Means respectively: 77.43%,

69.82%), and Alasrya nurses also have lower perceptions than the other universities (Mean=77.27%).

The results in the table (4.11) show that there are statistically significant differences at the level of 0.05 in the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the Workplace, the p-value of the test is 0.039, and the results of Tukey pairwise comparisons tests in the table (4.12) show that the mean value of the perceptions of nurses who work in Almeezan hospital (Mean=85.61%) is higher than the mean of the perceptions of nurses who work in Alahli hospital (Mean= 75.89%). Generally, the perceptions of nurses who work in the hospitals (Beit lahem alarabya, Alyamama, Alkhaleel, Beit jala, Karetas, Almeezan; Means: 81.21%-85.61%) are higher than the perceptions of the nurses who work in the hospitals (Alhelal and Alahli; Means: 75.89%-77.36%).

The results in the table (4.11) show that there are statistically significant differences at the level of 0.05 in the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the monthly income, the p-value of the test is 0.001, and the results of Tukey pairwise comparisons tests in the table (4.12) show that the means of the perceptions of nurses form the monthly income groups (More than 2500, Mean=81.18%) and (2000-2500, Mean=83.64%) are significantly higher than the mean of the perceptions of nurses form the monthly income group (Less than 2000, Mean=63.64%).

Finally, the results in the table (4.11) show that there are statistically significant differences at the level of 0.05 in the nurses' perceptions toward the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the years of experience, the p-value of the test is 0.022, and the results of Tukey pairwise comparisons tests in the table (4.12) show that the means of the perceptions of nurses form the years of experience group (Less than 5 years, Mean=83.22%) is significantly higher than the mean of the perceptions of nurses form the monthly income group (More than 10 years, Mean=77.87%).

Based on the previous results, the researcher rejected the null hypothesis H5 only regarding the factors (Age, Graduation University, Workplace, Monthly Income, and Years of Experience).

Table (4.12-A): Tukey Pairwise Comparisons for differences in the nurses' perceptions based on (Age, Graduation University, Workplace, Monthly Income, and Years of Experience).

Age (I)	Age (J)	Mean Difference (I-J)	Std. Error	P-value
up to 25 years	26-30 years	-0.099	1.797	0.998
	31 years or more	5.906*	1.985	0.010*
26-30 years	up to 25 years	0.099	1.797	0.998
	31 years or more	6.005*	1.733	0.002*
31 years or more	up to 25 years	-5.906*	1.985	0.010*
	26-30 years	-6.005*	1.733	0.002*
Graduation University (I)	Graduation University (J)	Mean Difference (I-J)	Std. Error	P-value
Arab American	Alahlya	10.788	4.799	0.382
	Alasrya	14.727	5.317	0.135
	Hebron university	14.567*	4.032	0.013*
	AlQuds university	9.824	3.676	0.169
	Alnajah	-1.333	5.788	1.000
	Beit Lehem	11.917	3.927	0.070
	Alahli College	22.182*	5.013	0.001*
	Other (Karetas and Ibn Seina)	9.273	6.631	0.896
AlQuds university	Alahlya	0.964	3.380	1.000
	Arab American	-9.824	3.676	0.169
	Alasrya	4.904	4.081	0.955
	Hebron university	4.743	2.156	0.412
	Alnajah	-11.157	4.679	0.302
	Beit Lehem	2.094	1.951	0.977
	Alahli College	12.358*	3.676	0.028*
	Other (Karetas and Ibn Seina)	-0.551	5.689	1.000

Table (4.12-B): Tukey Pairwise Comparisons for differences in the nurses' perceptions based on (Age, Graduation University, Workplace, Monthly Income, and Years of Experience).

Alnajah	Alahlya	12.121	5.605	0.437
	Arab American	1.333	5.788	1.000
	Alasrya	16.061	6.054	0.176
	Hebron university	15.900*	4.963	0.044*
	AlQuds university	11.157	4.679	0.302
	Beit Lehem	13.251	4.878	0.153
	Alahli College	23.515*	5.788	0.003*
	Other (Karetas and Ibn Seina)	10.606	7.235	0.869
Workplace (I)	Workplace (J)	Mean Difference (I-J)	Std. Error	P-value
Almeezan	Alhelal	8.251	3.502	0.273
	Beit jala	3.667	2.866	0.905
	Beit lahem alarabya	4.394	3.425	0.904
	Alahli	9.721*	3.094	0.043*
	Alkhaleel	1.970	3.990	1.000
	Alyamama	1.288	3.829	1.000
	Karetas	3.671	2.852	0.902
Monthly Income (I)	Monthly Income (J)	Mean Difference (I-J)	Std. Error	P-value
Less than 2000	2000-2500	-20.000*	5.085	0.000*
	More than 2500	-17.547*	4.824	0.001*
2000-2500	Less than 2000	20.000*	5.085	0.000*
	More than 2500	2.453	1.968	0.428
More than 2500	Less than 2000	17.547*	4.824	0.001*
	2000-2500	-2.453	1.968	0.428
Years of experience (I)	Years of experience (J)	Mean Difference (I-J)	Std. Error	P-value

Table (4.12-C): Tukey Pairwise Comparisons for differences in the nurses' perceptions based on (Age, Graduation University, Workplace, Monthly Income, and Years of Experience).

Less than 5 years	5-10 years	2.519	1.699	0.303
	More than 10 years	5.353*	1.931	0.018*
5-10 years	Less than 5 years	-2.519	1.699	0.303
	More than 10 years	2.834	2.025	0.344
More than 10 years	Less than 5 years	-5.353*	1.931	0.018*
	5-10 years	-2.834	2.025	0.344

* The mean difference is significant at the 0.05 level.

H6) there are no significant relationships at the level of (α = 0.05) between the nurses' challenges that encountered during the implementation of triage at pediatric emergency departments across the southern West Bank hospitals and their socio demographic factors and the clinical characteristics.

The researcher used the one way analysis of variance (One Way ANOVA) and the independent samples T-tests to test the differences in the nurses' challenges due to the socio demographic factors. Table 4.13 shows the results.

Table (4.13-A): Association between the socio-demographic, clinical characteristics and nurse's challenges level.

Factor	Category	N	Mean	Standard Deviation	F or T (P-value)
Age	up to 25 years	33	67.37	14.70	1.728 (0.182)
	26-30 years	60	65.18	8.16	
	31 years or more	37	69.40	11.08	
Gender	Male	49	70.52	11.79	2.969 (0.004)*
	Female	81	64.77	10.00	
Marital Status	Single	49	68.13	14.34	0.963 (0.338)
	Married	81	66.21	8.44	
Educational Level	Diploma	13	63.79	6.55	1.068 (0.347)
	Bachelor's Degree	112	67.07	11.51	
	Postgraduate Studies	5	72.00	7.17	
Graduation University	Alahlya	6	60.26	5.79	2.665 (0.01)*
	Arab American	5	72.31	8.43	
	Alasrya	4	70.77	5.33	
	Hebron university	17	75.84	14.06	
	AlQuds university	66	66.34	9.90	
	Alnajah	3	61.03	2.35	
	Beit Lehem	22	64.27	12.28	
	Alahli College	5	63.08	4.35	

Table (4.13-B): Association between the socio-demographic, clinical characteristics and nurse's challenges level.

	Other (Karetas and Ibn Seina)	2	57.69	3.26	
Workplace	Alhelal	11	79.30	11.35	8.036 (0.000)*
	Beit jala	30	67.74	10.15	
	Beit lahem alarabya	12	66.67	5.77	
	Alahli	19	69.23	7.47	
	Alkhaleel	7	80.88	15.10	
	Almeezan	12	61.41	6.34	
	Alyamama	8	62.88	9.10	
	Karetas	31	60.50	9.47	
Job Title	Nurse	127	66.87	11.14	0.445 (0.657)
	Department Head	3	69.74	3.55	
Monthly Income	Less than 2000	3	80.00	0.00	2.239 (0.111)
	2000-2500	21	66.01	11.59	
	More than 2500	106	66.75	10.89	
Years of Experience	Less than 5 years	57	66.45	12.82	0.207 (0.813)
	5-10 years	44	66.82	8.44	
	More than 10 years	29	68.06	10.95	
Receiving orientation period	Yes	102	66.23	11.18	1.398 (0.164)
	No	28	69.51	10.20	
Receiving courses	Yes	52	65.50	9.55	1.212 (0.228)
	No	78	67.89	11.87	
Receiving specialized training in triage system	Yes	38	64.70	8.05	1.495 (0.137)
	No	92	67.86	11.95	
Receiving continuous educational programs	Yes	37	63.45	11.11	2.311 (0.022)*
	No	93	68.32	10.74	
Triage system used in the hospital	Australian Triage Scale (ATS)	13	64.02	7.42	1.352 (0.255)
	Toowoomba Adult Trauma Triage Tool (TATTT)	6	73.59	8.94	
	Manchester Triage System (MTS)	19	68.26	7.88	
	Other	7	61.10	9.35	
	I don’t know	85	67.10	12.11	

* The test is significant at the 0.05 level.

The results in the table (4.13) show that there are statistically significant differences at the level of 0.05 in the nurses' challenges that encountered during the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to gender, the p-value of the T-test is 0.004, and the results of the T test in

the table (4.13) show that the mean of the challenges for males (Mean=70.52%) is significantly higher than the mean of the challenges for females (Mean=64.77%).

The results in the table (4.13) show that there are statistically significant differences at the level of 0.05 in the nurses' challenges that encountered during the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the Graduation University, the p-value of the test is 0.01, and the results of Tukey pairwise comparisons tests in the table (4.14) show that the mean value of the challenges of nurses who graduated from the Hebron university (Mean =75.84%) is significantly higher than the means of the challenges of nurses who graduated from the universities (AlQuds university and Beit Lehem; Means respectively: 66.34%, 64.27%). Generally, the challenges are higher for the nurses graduated from Hebron university, Arab American university, and Alasrya (70.77%-75.84%) than the other universities.

The results in the table (4.13) show that there are statistically significant differences at the level of 0.05 in the nurses' challenges that encountered during the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to the Workplace, the p-value of the test is 0.000, and the results of Tukey pairwise comparisons tests in the table (4.14) show that the mean values of the challenges of nurses who work in Alkhaleel, Alhelal, and Alahli, hospitals (the Means are 80.88%, 79.30%, 69.23% respectively) are higher than the mean of the challenges of nurses who work in the other hospitals.

Finally,the results in the table (4.13) show that there are statistically significant differences at the level of 0.05 in the nurses' challenges that encountered during the implementation of triage at pediatric emergency departments across the southern West Bank hospitals only due to receiving continuous educational programs, the p-value of the T-test is 0.022, and the results of the T test in the table (4.13) show that the mean of the challenges for nurses who didn’t receive educational programs (Mean=68.32%) is significantly higher than the mean of the challenges for nurses who received continuous educational programs (Mean=63.45%).

Based on the previous results, the researcher rejected the null hypothesis H6 only regarding the factors (Gender, Graduation University, Workplace, and Receiving continuous educational programs).

Table (4.14-A): Tukey Pairwise Comparisons for differences in the nurses' challenges based on (Graduation University and Workplace).

Graduation University (I)	Graduation University (J)	Mean Difference (I-J)	Std. Error	P-value
Hebron university	Alahlya	15.581	4.983	0.055
	Arab American	3.529	5.339	0.999
	Alasrya	5.068	5.832	0.994
	AlQuds university	9.497*	2.854	0.031*
	Alnajah	14.811	6.572	0.379
	Beit Lehem	11.571*	3.389	0.024*
	Alahli Collige	12.760	5.339	0.299
	Other (Karetas and Ibn Seina)	18.145	7.845	0.343
Workplace (I)	Workplace (J)	Mean Difference (I-J)	Std. Error	P-value
Alhelal	Beit jala	11.557*	3.305	0.015*
	Beit lahem alarabya	12.634*	3.914	0.033*
	Alahli	10.070	3.553	0.096
	Alkhaleel	-1.578	4.534	1.000
	Almeezan	17.890*	3.914	0.000*
	Alyamama	16.416*	4.357	0.006*
	Karetas	18.804*	3.291	0.000*
Alahli	Alhelal	-10.070	3.553	0.096
	Beit jala	1.487	2.749	0.999
	Beit lahem alarabya	2.564	3.458	0.996
	Alkhaleel	-11.648	4.146	0.102
	Almeezan	7.821	3.458	0.323
	Alyamama	6.346	3.952	0.746
	Karetas	8.735*	2.732	0.036*

Table (4.14-B): Tukey Pairwise Comparisons for differences in the nurses' challenges based on (Graduation University and Workplace).

Alkhaleel	Alhelal	1.578	4.534	1.000
	Beit jala	13.136*	3.936	0.024*
	Beit lahem alarabya	14.213*	4.460	0.037*
	Alahli	11.648	4.146	0.102
	Almeezan	19.469*	4.460	0.001*
	Alyamama	17.995*	4.853	0.007*
	Karetas	20.383*	3.924	0.000*

* The mean difference is significant at the 0.05 level

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4.9 Summary of the Results

The study revealed that nurses' subjective perceived knowledge about triage implementation in pediatric emergency departments (PEDs) across southern West Bank hospitals is low, with an average score of 57.3%. They reported limited understanding of triage processes, the ability to perform triage tasks, and to explain the system to colleagues. Objective knowledge was even lower at 45.2%, with some moderate awareness of triage priorities but very limited knowledge of core triage system elements. Notably, subjective and objective knowledge levels showed no significant correlation. Conversely, nurses' perceptions toward triage implementation were high (81.2%), recognizing its critical role in patient safety, quality of care, and managing ED congestion, though they acknowledged the significant resources required and doubted the ability to control overcrowding without triage. Regarding barriers and challenges, nurses identified moderate obstacles (66.9%), highlighting lack of public awareness, insufficient support from decision-makers, inadequate educational signage, and high workload as major issues, while staffing shortages and financial constraints were considered less challenging. Hypothesis testing showed a significant positive correlation between nurses' knowledge and perceptions, while no significant link was found between knowledge and challenges. A significant negative correlation existed between perceptions and challenges, indicating that better perceptions relate to fewer challenges. Sociodemographic factors influenced knowledge, perceptions, and challenges differently: objective knowledge varied with marital status, graduation university, and income, with single nurses and graduates from specific universities scoring higher; perceptions were affected by age, university, workplace, income, and experience, with younger nurses and those from certain institutions showing more positive views; and challenges differed by gender, university, workplace, and ongoing education, with males, Hebron University graduates, nurses at some hospitals, and those lacking continuous education perceiving greater obstacles.

Chapter Five

Discussion

5.1 Introduction

This chapter compare the results of the studies that conducted on the same topic, also it will include the recommendations, limitations and conclusion of the study.

5.2 Comparison between the results of this study and previous studies

5.2.1 Comparison of studies about the level of triage's knowledge

Despite the critical role of triage in pediatric emergency departments, there is a notable scarcity of prior research focusing specifically on nurses' subjective and objective knowledge, as well as the challenges they face in this area, particularly within the context of the southern West Bank. This gap in the literature makes it difficult to benchmark or compare findings, underscoring the importance of this study in addressing an underexplored aspect of emergency care. By examining both subjective and objective knowledge levels and identifying environmental and institutional barriers, this research provides valuable insights to inform targeted educational interventions and policy improvements.

The results of our study showed poor knowledge among nurses regarding triage, in which the subjective knowledge was 57.3%. This low knowledge show the need for more education for nurses about triage which is consider as one of the important aspect in pediatric ED. Also environmental challenges such as overcrowding, time constrain consider as possible causes that may affect the nurses ability to learn about triage. Also many factors related to facilities may affect the level of knowledge such as lack of training, absence of clinical orientation programs, weak institutional awareness.

Also low level of objective knowledge 45.2% Indicates a lack of subtle self-awareness. For example nurses knowledge regarding the implementation of triage at pediatric emergency departments across the southern West Bank hospitals was very low. Also nurses showed low knowledge regarding whether the patient with the green card needs urgent and immediate medical intervention. Many factors may affected

this type of knowledge such as lack of structured education in the field, absence of standardized protocols.

As mentioned before there's a gap between subjective and objective knowledge but without significant correlation which may be related to lack of self-assessment accuracy, in which nurses may perceive their competence based on their experience or familiarity not based on real knowledge. This rational was clarified in Dunning-Kruger effect (Mazor, et al, 2021) which describes a tendency for incompetent individuals to overestimate their ability.

The difference between perceived (subjective) and actual (objective) knowledge can significantly affect clinical decision-making. When nurses misjudge their triage abilities, they might inaccurately evaluate patient severity, resulting in care delays for critically ill individuals or inappropriate resource distribution to less urgent cases. This may jeopardize patient safety, elevate congestion in emergency departments, and obstruct the overall effectiveness of care provision.

Regarding nurses knowledge about triage, our study reflected low level of objective knowledge (45.2%) and subjective knowledge (57.3%) regarding triage among nurses. On other hand, regional study conducted by (Seda, 2020) in Gaza which showed higher average of knowledge score (76%). Despite that both studies were conducted in Palestine, but there's a variation in the level of knowledge, low levels of knowledge in our study may be related to low focus on education about triage for nurses in pediatric emergency department in which our results showed that 48.5% of nurses didn't received theoretical and practical lectures on the system of work of the triage in the ED.

On other hand an international study AlShatarat et al. (2022) showed higher levels of knowledge compared to our results because the nurses in (AlShatarat et al., 2022) had access to their triage systems and the majority (53.7%) utilize triage systems on a daily basis.

In addition, two international studies supported our findings by reporting low levels of knowledge among nurses regarding triage systems (Pouy, 2019; Atigo & Yousif, 2021). Several factors contribute to the low levels of knowledge in Palestine, including a crowded working environment, lack of resources, and pressures resulting from the ongoing occupation.**5.2.2 Comparison of studies about the level of triage's perception**

Our results showed high level of perception regarding triage may be related to their frequent exposure to triage scenarios in clinical practice and their familiarity with the process related to their high experience. As mentioned in our results, there's a positive correlation between years of experience and nurses perception.

The findings of our study showed high levels of perception among nurses with mean score (4.06 (0.43) with percentage (81.2%) regarding triage. The same consistent

findings revealed by previous study (Afaya et al., 2017) which reflected that the majority of nurses (96%) in the pediatric emergency departments of the various hospitals had a positive perception about the importance of triage.

Despite the presence of low knowledge, there is a positive perception among nurses. This result could be attributed to several factors, such as professional culture, individual convictions, and awareness of the importance of maintaining order in organizing work. However, according to the Theory of Planned Behavior (Ajzen, 1991), positive perception alone is insufficient without adequate knowledge.

Despite the generally positive perception of triage among nurses, there remains a critical area of weakness: the misconception that overcrowding in emergency departments can be effectively controlled without proper patient sorting through triage. This misunderstanding undermines the core purpose of triage, which is to prioritize patients based on the urgency of their condition. When overcrowding is seen as manageable without sorting, it can lead to delays in care for critically ill patients, inefficient use of resources, and overall reduced quality and safety of emergency care. Addressing this misconception is essential to improving triage effectiveness and ensuring that patient outcomes are optimized in busy pediatric emergency settings.

The results of nurses' perception regarding triage in our study showed that the triage system affects the quality of healthcare in EDs significantly (89.7%), also showed that triage system is one of the foundations of patient safety in ED (88.0%). The same findings revealed by previous qualitative study (Fekonja et al., 2024) which showed that care and safety are intrinsically associated and simultaneously manifest during the triage process. On other hand another study disagreed with our results and showed that the overall average perception of the triage was 57.27% which mean it's was non-positive and requires improvement. This variation may be related to the adoption of larger sample size in the previous study (201 participants) if compared with our study (135 participants)

5.2.3 Comparison of studies about the level of triage's challenges

The findings of this study showed that the level of the total degree of the obstacles and challenges that encounter the nurses when implementing triage in pediatric emergency departments across the southern West Bank hospitals is low. This might indicate sufficient administrative support, presence of fundamental triage protocols, or controllable patient numbers that alleviate operational pressure. However, the low reported level of challenges may result from underreporting due to lack of awareness of systemic problems, normalization of less-than-ideal conditions, or an absence of thorough evaluation processes. Thus, although the low perception of obstacles is positive, it requires additional examination to confirm that it genuinely represents the clinical situation and is not concealing hidden barriers that may affect the effectiveness and uniformity of triage implementation.

Challenges to pediatric triage can be categorized into three interconnected levels: health system, staff-related, and community-related factors. At the health system level, issues such as an unsatisfactory work environment, lack of financial and administrative support, overcrowding, limited time, and heavy workload demands create significant barriers to effective triage. These systemic challenges directly impact the staff's ability to perform efficiently. At the staff level, problems including inadequate staffing and low nurse motivation further hinder the successful implementation of triage. Moreover, at the community level, insufficient public awareness and limited engagement in the triage process exacerbate these difficulties. Together, these interrelated factors present substantial obstacles to the effective implementation of triage systems in pediatric emergency settings.

The establishment of pediatric triage systems faces significant obstacles, such as insufficient institutional commitment, low public awareness, and high job stress. In the absence of robust backing from decision-makers, triage initiatives frequently suffer from insufficient resources and lack of strategic guidance. Restricted public comprehension results in impractical anticipations and possible disputes in crises. Moreover, excessive workloads and lack of staff hinder the reliable and precise implementation of triage protocols. Resolving these problems is crucial for maintaining efficient and sustainable triage procedures in pediatric emergency departments.

Our study founded that the work environment is unsuitable and inadequate for the effective implementation of the triage system (59.7%). Also previous study (Wolf et al., 2018) showed that environmental factors can impact the decision-making abilities of nurses regarding triage. Both studies also indicated that an increase in nurses' perceptions is associated with a reduction in the challenges they face regarding triage implementation, highlighting the importance of a supportive and well-structured environment for the effective application of the triage system.

Our results showed that it was not appear and no clear conviction or genuine willingness among decision-makers to implement the triage system. The same findings reflected by recent study (Yang et al., 2023) which showed that regarding the decision making in triage, previous study reflected low level of decision making regarding triage in northern China. Both studies reflected low level of knowledge regarding triage which may be the cause for inability to make real triaging decision.

Our results and the findings of recent study (Olofinbiyi & Makhado, 2024) showed that patients' overcrowding is one of the obstacles to implementing the triage system. Also our findings agreed with two previous studies (Badawy et al., 2019; Gruba, 2016) which mainly showed that time limitation consider as one of the significant challenges for nurses regarding triage.

Financial constrain considered as one of the challenges that affect traige system in our reuslts and in previous study (Ahmed et al., 2025). Without adequate investment,

healthcare facilities may struggle to standardize triage procedures, maintain staff competencies, or integrate triage systems into existing infrastructures, ultimately compromising the quality and efficiency of emergency care delivery.

5.2.4 Comparison of sociodemographic findings

As mentioned in our results, The significant impact of demographic elements like marital status, university attended, income, age, employment site, and experience on nurses' triage expertise and views emphasizes the necessity for fairer training policies. Training programs that are standardized and accessible must be established to guarantee that all nurses, irrespective of their background, have the same chances for skill enhancement. Customized assistance and adaptable formats can help close current gaps and foster equity in career advancement.

Variations in triage understanding and viewpoints among nurses carry significant educational and organizational consequences. They emphasize the necessity for uniform education, fair access to training, and organizational backing to guarantee that all nurses are equally equipped. Filling these gaps can enhance the uniformity and standard of triage methods throughout healthcare environments.

The findings of our study revealed that means of the perceptions of nurses form the years of experience was significant (p= 0.022) among nurses regarding the perception of triage. Previous study conducted by (Zaboli et al., 2024) and showed that higher triage nurse's expertise resulted in statistically significant improvements in overall outcomes of triage system.

Another international study Bahlibi et al.(2022) showed that regarding nurses' knowledge about triage, just one (3%) nurse was found to possess sufficient knowledge about triage before the intervention and after receiving education about triage. The percentage of nurses with sufficient knowledge rose to 39% which mean that education lead to significant improvement in triage's knowledge. On other hand, our study showed that neither receiving specialized training in triage system, nor receiving continuous educational program were founded to have significant effect on nurses knowledge about triage.

Our study showed many of significant relationships between these variables in which (marital status, Graduation University, and monthly Income) were significantly associated with nurses’ knowledge regarding triage. Also (age, graduation university, workplace, monthly income, and years of experience) were significantly associated with nurses perception regarding triage. On other hand previous study was conducted by (Seda, 2020) to assess nurses' knowledge and perceptions regarding the implementation of the triage system in pediatric emergency departments. The findings of this study showed that factors that led to higher knowledge about triage included training, have bachelor degree. Also low knowledge found among participants from the age group 28 – 38. This variation between both studies may be due to the difference in sociodemographic data among the participants between both studies.

In Jordan, and regarding to the relationship between experience and nurses knowledge about triage, previous study (Malak, et al, 2022) showed positive relationship between them, while our study reflected the absence of significant correlation between these variables. This highlights the potential influence of other factors such as ongoing training, institutional support, and access to updated triage protocols. Therefore, relying solely on years of experience may not be sufficient to ensure competency in triaging.

Recent study Bahre et al. (2024) showed that education level and triage experience were important factors influencing nurses' knowledge of triage—that is, higher education or more experience was associated with better knowledge.

However, in our study, no significant relationship was found between nurses' triage knowledge and their education level or experience. This difference might be due to variations in the sociodemographic characteristics of the samples between the two studies. For example, our study included a more detailed breakdown of education levels, ranging from diploma to postgraduate degrees. This greater diversity in educational backgrounds might have contributed to the differing results, as the influence of education on knowledge may not be as straightforward when education categories are more granular.

5.2.5 Comparisons about the relationship between nurses' knowledge and perception about triage.

As indicated in our results, indicate that increased knowledge is positively associated with more favorable perceptions of triage among nurses. This result align by The KAP model (Kang et al., 2024) indicates that knowledge influences perceptions, which subsequently affect practices. According to this model, increased knowledge fosters the development of more accurate and positive perceptions, ultimately encouraging the desired behavioral outcomes.

Our results showed that significant positive correlation at the level of ($\alpha = 0.05$) between nurses' knowledge and their perceptions. In which the increase in the knowledge lead to increase in triage's perception among nurses. These findings align with those of two previous studies (Sutriningsih, Wahyuni, & Haksama, 2020; Alazaka & Mohamed, 2024), which showed that nurses perceptions were positively influenced by knowledge ($p = 0.017$). This agreement between all studies due to the use of same design (cross-sectional) between in both studies and same sampling method (convenience). The positive correlation between knowledge and perception in our study could be due that during the assessment of perception, 87.7% of nurses reflected the need to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED, which showed that nurses beleive that higher knowledge can lead to good perception regarding triaging.

5.2.6 Comparisons about the relationship between nurses' knowledge and challenges of triage.

Our results showed the lack of significant association between nurses knowledge and challenges regarding triage, this results could be justefied because the challenges are related to structural factors, not just knowledge.

Regarding triage's challenges, our study showed that no significant correlation at the level of ($\alpha = 0.05$) between nurses' knowledge and their challenges about triage. On other hand, a systematic review study (Abbasi et al., 2022) showed that Insufficient knowledge about triage consider as one of the most common challenges for nurses, in which low level of knowledge increase the problem for good triage. The lack of significant association between knowledge and challenges may be related to discrepancy between theoretical knowledge and practical environment in Palestine, in which many healthcare workers receive triage education in controlled or academic settings, which may not translate effectively to the high-pressure, resource-constrained, or conflict-affected environments they face daily.

5.2.7 Comparisons about the relationship between nurses' perception and challenges of triage.

The resluts in this study showed negative association between nurses' perception and challenges of triage. The negative link found between nurses' views on triage and the difficulties they face can be explained using Social Cognitive Theory (Bandura, 2014). This theory highlights the importance of self-efficacy—people's confidence in their capacity to execute tasks successfully. Nurses who have heightened perception (i.e., increased awareness and confidence in triage principles) tend to have enhanced self-efficacy, allowing them to see potential challenges as manageable instead of insurmountable. Consequently, they recognize fewer obstacles in executing triage.

Our results showed significant negative correlation at the level of ($\alpha = 0.05$) between nurses' perceptions and their challenges about triage which mean that the increase of the nurses' perceptions decreases their challenges about triage implementation. Also previous study revealed that negative perceptions can create barriers to efficient and effective triage practices. Despite the difference of research method both of them agreed about the effect of perception on challenges of triage which may related to universal challenges in triaging worldwide among nurses (Fekonja et al., 2024).

Also recent study (Bijani & Khaleghi, 2019) agreed with our findings about the negative correlation at the level of ($\alpha = 0.05$) between nurses' perceptions and their challenges about triage. This agreement related to the complain from same challenges by nurses in both studies in which they considered lack of resources, overcrowding consider as huge problems of triage.

5.3 Practical Implications

The findings of this study provide critical insights for healthcare administrators and policy-makers seeking to improve triage practices in pediatric emergency departments in Palestine.

1. Training and Professional Development: Implement standardized, evidence-based triage training courses for all emergency nursing staff. These measures will help reduce variability in knowledge due to differences in educational background and experience, and improve both competence and confidence among nurses.

2. Policy and Protocol Development Recommendation: develop and enforce clear, eveidence-based protocols for triage system in pediatric ED.

3. Proposing educational and administrative interventions (e.g., standardized courses, emergency awareness posters, mandatory pre-appointment training).

5.4 Strengths and Limitations

5.4.1 Strength of the study

First, in regard to the study's sample and sampling method, the sample size considered enough for this study, as it helped in collecting enough information, this will facilitate the process of our findings.

Also, the sample included representative participants that reflected the general population, and covered a lot of factors such as sociodemographic characteristics of the participants including age, gender and other factors that reflect the characteristics of entire population. The data collection of the research was also strong, as manifested by the very low percentage of missing data.

In addition, data collection process was done by using many of valid and reliable tools and the results were analyzed carefully.

5.4.2 Limitations of the study

This study has several limitations that may affect interpretation and generalizability of its findings. Firstly, the sample was geographically restricted to pediatric emergency departments in the southern West Bank, which may not fully represent the experiences and practices of nurses in other regions of Palestine or in different healthcare settings. Secondly, the reliance on self-reported data creates the potential for response bias, particularly social desirability bias, as participants may have overestimated their knowledge or under reported challenges. Lastly, the study did not incorporate any direct observational or behavioral follow-up to assess actual triage performance in practice, limiting the ability to determine how reported knowledge and perceptions translate into real-world clinical behavior.

5.5 Conclusion

The findings highlight a clear gap in nurses' objective knowledge regarding triage implementation in pediatric emergency departments, with subjective knowledge being only slightly higher. The positive correlation between knowledge and perception suggests that enhancing nurses' understanding may improve their attitudes toward triage, while stronger perceptions were associated with fewer reported challenges.

Although nurses demonstrated generally positive perceptions toward triage, they still faced moderate challenges, particularly those related to organizational and contextual factors. No significant association was found between knowledge and perceived challenges, but perception was negatively correlated with the challenges encountered.

Several sociodemographic and professional factors were found to influence nurses' knowledge, perceptions, and challenges—including marital status, age, workplace, income level, and participation in continuous education.

To improve triage implementation in practice, comprehensive and sustained interventions are essential. This includes not only initial training but also ongoing professional development, use of simulation-based learning, and integration of triage protocols into clinical systems. Continuous monitoring and feedback are also necessary to ensure long-term effectiveness, consistency, and adaptation to the specific needs of emergency departments.

5.6 Recommendations

5.6.1 Recommendations for Future Studies:

1. Conduct longitudinal studies to assess changes in nurses' triage knowledge and perceptions over time and after training interventions.

2. Explore the association between triage knowledge and actual practice through observational studies.

3. Examine the impact of organizational and environmental factors (e.g., hospital resources, patient load) on triage system performance.

4 Conduct of interventional studies to assess the effect of education and training on nursing outcomes in relation to triage.

5. Comparison with Adult Emergency Departments

- Comparing the accuracy and clinical outcomes of triage tools used in adult ED to their performance in pediatric settings, in order to assess their suitability and effectiveness for children.

- Assess differences in staff training, decision-making, and triage errors.

6. Study the effect of real triage system implementation

- Assess before-after effects of implementing a new triage system

.- Measure operational, clinical, and implementation outcomes

.- Explore system integration, staff compliance, and sustainability.

5.6.2 Recommendations for Decision Makers:

1. Standardize triage protocols across all pediatric emergency departments in the southern West Bank to ensure consistency and quality of care.

2. Develop and implement continuous training programs focused on pediatric triage for emergency nurses.

3. Allocate sufficient resources, including staff and equipment, to support the effective functioning of triage systems.

4. Include other healthcare professionals (e.g., physicians, paramedics) to gain a broader understanding of triage system implementation challenges.

5.6.3 Recommendations for Nurses:

1. Participate in continuous professional development activities, including workshops and certification programs, specifically focused on pediatric triage.

2. Participate actively in institutional efforts to improve triage protocols and emergency department workflows.

3. Collaborate and share best practices with colleagues to improve consistency and confidence in triage decisions.

4. Report challenges and limitations in triage practice to supervisors or quality assurance committees to advocate for change.

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Where is the Consent Form
Questionnaire (English)

Section 1: sociodemographic Data

1.	Age: ..... years.
2.	Gender: Male ☐ Female ☐
3.	Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐
4.	Educational Level: Diploma ☐ Bachelor's Degree ☐ Postgraduate Studies ☐
5.	University from which you graduated: .....
6.	Workplace:.....
7.	Job Title: Nurse ☐ Department Head ☐ Nursing Supervisor ☐
8.	Monthly Income in Shekels: Less than 2000 ☐ 2000-2500 ☐ More than 2500 ☐
9.	Years of Experience: Less than 5 ☐ 5-10 years ☐ More than 10 years ☐
10.	Did you receive an orientation period about the tasks of the emergency department before starting your main work? Yes ☐ No ☐
11.	If your answer is yes, specify the duration: Less than a month ☐ 1-3 months ☐ More than 3 months ☐
12.	Have you received any courses during your work in the emergency department? Yes ☐ No ☐
13.	If your answer is yes, specify the entity providing the course: University inside the West Bank ☐ Hospital inside the West Bank ☐
14.	Course duration: Less than a month ☐ 1-3 months ☐ More than 3 months ☐
15.	Have you received specialized training in the triage system for children? Yes ☐ No ☐
16.	If your answer is yes, please specify the entity providing the course: University inside the West Bank ☐ Hospital inside the West Bank ☐
17.	Duration: Less than a month ☐ 1-3 months ☐ More than 3 months ☐
18.	Do you receive continuous educational programs to develop your performance and stay updated on the latest in children's emergency systems?

	Yes ☐ No ☐
19.	What triage system is used in the hospital where you work? ☐Australian Triage Scale (ATS) ☐Toowoomba Adult Trauma Triage Tool (TATTT) ☐Manchester Triage System (MTS) ☐Other: _____ ☐I don't know

Knowledge about triage system

No.	Item	Agree	Disagree
1	I received theoretical and practical lectures on the system of work of the triage in the ED		
2	I have enough knowledge about how the triage system works in the ED		
3	I have the ability to clearly explain how the triage system works for other colleagues		
4	I can perform nursing tasks in the medical triage hall based on a thorough knowledge of the triage system		
5	I can distinguish between the Triage system cards and the time value and priority of each		
6	The Triage system is based on sorting cases with different color cards globally agreed upon		
7	I have full knowledge of the possible waiting time for each color individually		
8	The patient with the red card can wait up to an hour for medical care		
9	A yellow card patient can wait up to three hours for medical care		
10	The patient with the black card does not require medical care or intervention		
11	The patient with the green card needs urgent and immediate medical intervention		

Perception about triage system

No.	Item	Strongly disagree	Agree	Neutral	Disagree	Strongly agree
1	The Triage system affects the quality of healthcare in EDs significantly					
2	Triage plays a major role in reaching patients and their families					
3	The basis of the Triage system is based on the optimal utilization of capabilities and capabilities					
4	The implementation of the Triage system needs huge supplies and efforts					
5	Triage system is one of the foundations of patient safety in ED					
6	The Triage system is an effective way of dealing with congestion in the ED					
7	I believe in the importance of the role of the nurse in the application of the Triage system in the ED					
8	Nursing and medical staff can control the overcrowding of cases in the emergency department without activating the triage system					
9	I believe in the key role of the Triage system in providing emergency health care in the pediatric ED as a priority					
10	I would like to participate in courses, conferences and scientific activities that enhance the importance of applying the system of triage in ED					
11	We are convinced of the need to activate the Triage system in the management of cases at ED overcrowding					

Challenges to triage implementation

No.	Item	Strongly disagree	Agree	Neutral	Disagree	Strongly agree
1	I believe there are significant challenges and obstacles that will hinder the implementation of the triage system in the pediatric emergency department.					
2	The work environment is unsuitable and inadequate for the effective implementation of the triage system.					
3	There does not appear to be a clear conviction or genuine willingness among decision-makers to implement the triage system.					
4	The current nursing staff in my department is insufficient to implement the triage system.					
5	The nursing staff lacks genuine motivation to implement the triage system.					
6	Patient overcrowding is one of the obstacles to implementing the triage system.					
7	I do not believe that the public has sufficient awareness regarding the mechanism of the triage system.					
8	There seems to be no real public interest or desire for the implementation of the triage system.					
9	The department does not have adequate financial resources to implement the triage system easily and without hindrance.					
10	There are no security personnel available in the waiting area to manage disorder, which negatively affects the ability to adhere to the time constraints of the triage system.					
11	There are not enough educational signs in the waiting area to inform the public about how the triage system works.					
12	Nurses do not have enough time to implement the triage system in the pediatric emergency department.					
13	Workload pressure in the emergency department hinders the successful implementation of the triage system.					

Al-Quds University
Jerusalem
Deanship of Scientific Research

بسم الله الرحمن الرحيم

جامعة القدس
القدس
عمادة البحث العلمي

Research Ethics Committee
Committee's Decision Letter

Date: March 9, 2025
Ref No: 518/REC/2025

Dears Dr. Abdallah Alwawi, Mr. Bashar Siwad,

research ethics application. After reviewing your submission titled: "Assessment of nurses knowledge and perceptions regarding the implementation of a triage system in pediatric emergency departments in the southern west bank, Palestine", the Research Ethics Committee (REC) at Al-Quds University confirms that your application aligns with our ethics guidelines, which are based on the principles outlined in the Declaration of Helsinki.

Please note that this approval does not replace other required permissions, such as for sample shipment or data sharing. We also request a copy of your final report or publication when available.

This approval is valid for two years. If your research extends beyond this period, a renewal request will be necessary. The approval remains valid as long as there are no changes to the research protocol.

Sincerely,

Suheir Ereqat, PhD
Associate Professor of Molecular Biology
Suheir Ereqat
Research Ethics Committee Chair

Cc. Prof. Imad Abu Kishek - President
Cc. Members of the committee
Cc. file

تقييم معرفة الممرضين، وتصوراتهم، والتحديات المتعلقة بتطبيق نظام الفرز في أقسام الطوارئ للأطفال في جنوب الضفة الغربية، فلسطين.

إعداد: بشار جمال علي سواد

إشراف: د. عبد الله الواوي

الملخص

يعود أصل مصطلح "الفرز "(Triage)إلى الكلمة الفرنسية *trier*والتي تعني عمليات الفرز والتنظيم .يلعب ممرض/ممرضة الفرز دورًا محوريًا باعتباره نقطة الاتصال الأولى للأطفال في أقسام الطوارئ، من خلال ضمان التعرف السريع على الحالات المهددة للحياة وتحسين تدفق المرضى لتقليل أوقات الانتظار ومنع تدهور الحالة الصحية.

هدفت هذه الدراسة إلى تقييم معرفة الممرضين

الممرضات وإدراكهم والتحديات التي يواجهونها فيما يتعلق بتطبيق نظام الفرز في أقسام الطوارئ للأطفال في جنوب الضفة الغربية، فلسطين.

اعتمدت الدراسة على تصميم كمي مقطعي شمل الممرضين العاملين في أقسام الطوارئ للأطفال في مستشفيات جنوب الضفة الغربية، فلسطين .تم جمع البيانات باستخدام استبيانات ذاتية التعبئة .وبلغ حجم العينة (130)ممرضًا/ممرضة تم اختيارهم بطريقة العينة الميسّرة.

أظهرت نتائج الدراسة أن مستوى المعرفة الموضوعية للممرضين حول تطبيق الفرز في أقسام الطوارئ للأطفال في مستشفيات جنوب الضفة الغربية منخفض جدًا (45.2%)، وكذلك المعرفة الذاتية كانت منخفضة .(57.3%)بينما كان متوسط إدراك الممرضين مرتفعًا ± 4.06) 0.43)بنسبة مئوية بلغت .(81.2%)أما التحديات فكانت منخفضة، إذ بلغ المتوسط 3.35) 0.55) ±والنسبة المئوية .(66.9%)

وجدت الدراسة وجود علاقة ارتباط إيجابية ذات دلالة إحصائية (α = 0.05)بين معرفة الممرضين وإدراكهم .بينما لم يتم العثور على علاقة ارتباط ذات دلالة بين معرفة الممرضين والتحديات التي يواجهونها بشأن الفرز .كما تبين وجود علاقة ارتباط سلبية ذات دلالة إحصائية عند المستوى (α = 0.05)بين إدراك الممرضين والتحديات المتعلقة بالفرز.

وبالنسبة للعوامل الاجتماعية–الديموغرافية التي تؤثر على الفرز، فقد تأثرت المعرفة بكل من (الحالة الاجتماعية، الجامعة التي تخرج منها الممرض/الممرضة، والدخل الشهري .)بينما تأثر إدراك الممرضين بكل من)العمر، الجامعة التي تخرج منها الممرض/الممرضة، مكان العمل، الدخل الشهري، وسنوات الخبرة)كما وُجد أن العديد من العوامل تؤثر على التحديات التي يواجهها الممرضون في ما يتعلق بالفرز، ومنها (الجنس، الجامعة التي تخرج منها الممرض/الممرضة، مكان العمل، وتلقي برامج تعليمية مستمرة.)

تسلط هذه الدراسة الضوء على فجوة حرجة في المعرفة الموضوعية للممرضين بشأن الفرز في أقسام الطوارئ للأطفال، حيث بلغ متوسط الدرجة فقط (45.2%)، على الرغم من ارتفاع مستوى المعرفة الذاتية .إن معالجة هذا التباين أمر بالغ الأهمية، إذ إن تعزيز معرفة الممرضين قد يسهم في تحسين إدراكهم، وبالتالي التخفيف من التحديات التي تعيق تطبيق ممارسات فرز فعّالة.

الكلمات المفتاحية:

المعرفة، الإدراك، التحديات، نظام الفرز، أقسام الطوارئ للأطفال، فلسطي