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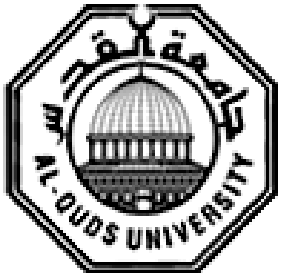

Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals

Ashraf Issam Helewa

MPH-Thesis

Jerusalem-Palestine

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Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals

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Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals

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Dedication

This is dedicated

To my great father,

To my beloved mother,

Whom I owe my life and success

To my brothers, my sisters and my family,

To my dear wife "Ahlam", and my sons

To my friends and colleagues and of course

to pure spirit of all martyrs and wounded who falls

defending our Palestinian land.

With Love and Respect

Ashraf Issam Helewa

Declaration

I certify that this thesis submitted for the fulfillment of the master program, and that it (or any part of it) has not been submitted for higher degree to any university or institution

Signature

Ashraf Issam Helewa

Date:

Acknowledgment

بسم الله الرحمن الرحيم

{مِنْ أَجْلِ ذَلِكَ كَتَبْنَا عَلَى بَنِي إِسْرَائِيلَ أَنَّهُ مَنْ قَتَلَ نَفْسًا بِغَيْرِ نَفْسٍ أَوْ فَسَادٍ فِي الْأَرْضِ فَكَأَنَّمَا قَتَلَ النَّاسَ جَمِيعًا وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا وَلَقَدْ جَاءَتْهُمْ رُسُلُنَا بِالْبَيِّنَاتِ ثُمَّ إِنَّ كَثِيرًا مِنْهُمْ بَعْدَ ذَلِكَ فِي الْأَرْضِ لَمُسْرِفُونَ}
سورة المائدة ، الآية(٣٢).

In the name of Allah , the Entirely Merciful, the Especially Merciful.

"Because of that, we decreed upon the Children of Israel that whoever kills a soul unless for a soul or for corruption [done] in the land - it is as if he had slain mankind entirely. And whoever saves one - it is as if he had saved mankind entirely. And our messengers had certainly come to them with clear proofs. Then indeed many of them, [even] after that, throughout the land, were transgressors" ***SURAHS (CHAPTERS), AL-MA'IDH(THE TABLE SPREAD), Verses (32).***

First and foremost, I thank Allah for helping me every moment and during my study.

I would like to express my profound and sincere gratitude to my supervisor, **Dr. Radwan Baroud**, for his ongoing encouragement, valuable comments, support, advice and endless patience in improving my writing. I have learned a lot from his experience. I really appreciate that. Thanks so much **Dr. radwan**.

My great thanks and gratitude's go to the department of public health and at Al-Quds University specially Dr. Basam Abu-Hamad and Prof. Yehia Abed for their insightful comments and guidance throughout my study period.

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I would like to thank health care providers the "unknown soldiers" whose working in Emergency Departments at Shifa Hospital, EGH, Al-Quds Hospital and A;-Awda hospitals for their acceptance to participate in the study.

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Ashraf Issam Helewa

Abstract

Triage considered one of the main components of emergency healthcare services at any emergency department. It is an essential element of modern medical care as it is necessary to assign relatively scarce resources to unlimited medical needs. This study focuses on evaluating the emergency department triage system at Gaza Strip hospitals emergency departments. It establishes baseline data and addresses the gaps in order to promote the provision of adequate emergency services meeting users' needs and expectations and to improve the quality of triage system.

The researcher used a descriptive, analytical, cross-sectional design which helped the researcher to collect quantitative and qualitative data. The researcher also adopted an analysis method to evaluate health care providers perceptions regarding to structure and design, human resource, equipment and machines, registration and documentation, communication, and standards and protocols of triage system in Al-Shifa, European Gaza Hospitals, Al-Awda and Al-Quds Hospital. The researcher adopt self-administered questionnaire with 252 health care providers (physicians, nurses, security, and administrators) in four eligible hospitals, in addition to twelve key persons were met through interview.

The study result shows that 90.1% of the total samples were males. The prominent age group in the sample was employees whose age between 23-30 years old. Employees who have a bachelor degree are most prominent in the sample. The results also show that average triage system score as perceived by health care providers is 63.7%. The dimensions, which elicited the highest positive ratings, were registration and documentation (65.3%), and communication (65.3%); meanwhile those with the lowest ratings included human resource (62.3%), and standards and protocols (61.6%). The overall perception from administrator point view was reached 78.2%% and security point view was 71.0%. Inferential statistics showed that nurses had elicited higher scores with statistically significant differences (P value less than 0. 05) in comparison to physicians. In addition, Al-Awda and Al-Quds hospitals are elicited higher scores in comparison to their counter groups.

The study recommended that the current triage system should be reformed and integrated in Prehospital Emergency Services (EMS) in addition to all hospital EDs, settings as a part of its standardized system. Conducting a periodical drill or simulation for managing a mass causality incident that help for testing the hospital emergency plan and redness of ED. Increase public awareness regarding the concept and importance of triage system. Providing well-trained co-workers (Stretcher workers) for handling and evacuating patients in the triage area. Increasing the functional capacity of triage area as well as providing a well prepared alternative area in case of mass causality triage, including reasonable numbers of beds, trolleys, stretchers and wheel chairs for transporting, carrying and evacuating patients, Staffing the ED with suitable number of security staff 24hr./7 days a week, to overcome and control the crowded in the EDs,

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List of Abbreviations

ATS	Australasian Triage Scale
CTAS	Canadian Triage Acuity Scale
ED	Emergency Department
EMS	Emergency Medical Services
ESI	Emergency Severity Index
GS	The Gaza Strip
MTS	Manchester Triage Scale
MOH	Ministry of Health
NGOs	Non-Governmental Organizations
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary Health Care
SMC	Shifa Medical Compound
UNRWA	United Nations Relief and Works Agency for Palestinian Refugees in the Near East
WB	West Bank
WHO	World Health Organization

Chapter (1) Introduction to the study

1.1 Background

Triage originates from the French word ‘‘trier’’, which means sorting patients or injuries according to severity and priority. The process of determining the priority of patient’s treatment based on the severity of their condition with good utilization and allocation of scares resources. It was originally applied, probably around 1792, by Baron Dominique Jean Larrey, Surgeon in Chief to Napoleon’s Imperial Guard (Iserson and Moskop, 2007).

Emergency Department (ED) triage considered one of the main components of emergency healthcare services at any Emergency Department (ED). It is an essential element of modern medical care as it is necessary to assign relatively scarce resources to unlimited medical needs. Such assignments become necessary where there is a mismatch in quantum, time or location between the medical needs of patients and available resources. In addition, major events can lead to sudden overwhelming demand. Triage in emergency healthcare is a continuous process, but also emphasized at key points in the continuum of care. These points include extrication from the scene, on arrival at the ED, upon admission to hospital and on presentation to operating theatres. Triage systems designed to serve the value of human life and health with fairness and the efficient use of resources (Fitzgerald et al., 2009).

The purpose of triage in the emergency department ED is to prioritize incoming patients and to identify those who cannot wait tell be seen. The triage nurse performs a brief, focused assessment and assigns the patient a triage acuity level, which is a proxy measure of how long an individual patient can safely wait for a medical screening,

examination, and treatment (Australian Governmental Department of Health and Ageing, 2012).

From the other side the overcrowding and lapses in patient safety are prevalent problems in emergency departments around the world. In a study conducted by American Hospital Association (AHA) , 91% of U.S. ED's responding to a national survey reported that overcrowding was a problem, and almost 40% of them reported overcrowding as a daily occurrence (AHA, 2002). In addition to causing long wait times, many research studies have linked delays due to overcrowding to elevated risks of errors and adverse events (Liu et al., 2005). This situation prompted the Institute of Medicine's Committee on Future of Emergency Care in the U.S, to recommend that "hospital chief executive officers adopt enterprise wide operations management and related strategies to improve the quality and efficiency of emergency care" (Institute of Medicine, 2007). In this study, the main aim is to investigate the current situation of triage system in Gaza hospitals emergency department.

1.2 Research problem

Triage is one of the important aspects of emergency department, at any healthcare facility worldwide, and most patients who visit the ED are seriously worried about their health considering themselves the most critical person that you should look after and have a strong feelings that they are in need for quick evaluation and help. It is clear that a smaller percentage of patients who visit the ED is severely ill and need immediate help. However, the others do not have the same need for rapid care. Caring for such a broad spectrum of patients in an adequate and timely manner represents a major challenge for emergency healthcare services. This raised the big question of triage! "Every Patient is Critical, So Who Goes First?"

In Gaza Strip (GS), the triage as knowledge was newly applied in both pre-hospital and hospital settings. Furthermore, the increasing number of causalities due to daily aggression and escalation of the Israeli Occupied Forces (IOF), make the situation worse. Many injuries rushing to the hospitals (EDs) disturbing the norms of these hospitals and make a huge burden over the scares resources, which are already exhausted. Thus the health officials and decision makers in the health system together with some international organization such as International Committee of Red Cross (ICRC), release the triage project in some of (GS) hospitals at (2010-2011). In this study, the researcher evaluates the effectiveness of such triage system in serving the emergency healthcare services, and underpinned the obstacles hinder the sustainability of triage system, which is newly applied in our hospitals.

1.3 Justification

Since the researcher is working in emergency field, which is the field of interest and through daily contact and observation of the hospital (EDs), it was a very clear that this new project (ED Triage), as a new knowledge has some uncertainty regarding its compliance with standards and protocols, which underpinned the need to be evaluated. Through this proposed study a set of recommendation based on the study result will be of a great value since this study will be the first of its kind that handle such issue.

1.4 Study objectives

1.4.1 Aim

The general objective of this study is to evaluate the ED triage system at Gaza Strip hospitals emergency departments, in order to promote the provision of adequate emergency services meeting user's needs and expectations and to improve the quality of triage system.

1.4.2 Specific objectives

1- To assess the current triage system.

2- To assess if the triage team complying with triage system.

3- To assess the design and spacing provided for triage area that affects the patient flow process.

4- To appraise areas of strength and weakness in the provided triage system services.

5- To recognize differences in the triage system service in reference to health care providers demographic and occupational characteristics.

6- To develop recommendations for key informants in the Ministry of Health (MOH) to develop better triage system based on the results of the study.

1.5 Research questions

1- What criteria and scales used currently by ED triage system?

2- To what extent the current triage system complies with standards and protocols?

3- Dose the available resources facilitate the triage and patient flow?

3- Dose the existing design and structure facilitate the triage and patient flow?

4- What are the communication and documentation tools used in the current triage system?

5- Are there enough trained people who involved in triage process?

6- Are there any differences in the application of triage system among hospitals?

1.6 Study Context

1.6.1 Gaza Strip

The GS is a narrow land, located on the southwest of Palestine on the coast of the Mediterranean Sea with an area of 365 km (Annex 1). GS is a high crowded area, where approximately 1.790.010 million live in 365 km2, with an estimated density of about 4.904 people per square kilometer (MOH, 2014a).

The population is concentrated in 7 towns, 10 villages and 8 camps. The density increases in refugee camps. GS is divided into five governorates, North of Gaza, Gaza city, Mid-Zone, Khan-Younis and Rafah. The province of Gaza where the highest population density with an estimated density of about 8.328 people per square kilometer, while Khan-Younis governorate was the least population density governorate, which represent 3.113/km2 (MOH, 2014b).

1.6.2 Palestinian health care system

The health care system in Palestine is complex and unique under Israeli occupation that strongly influences the health care system in Palestine. The consequence of closures and separation represent a great challenge for the MOH by creating obstacles regarding the accessibility to health care services and affect the unity of the health care system in all Palestinian Governorates. There are four major healthcare providers: the MOH, United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), Non-Governmental Organizations (NGOs) and for profit private sector. The MOH is the main health care provider; it provides primary, secondary, and tertiary care and purchases some services from private providers domestically and abroad. UNRWA is the second major source of providing Primary Health Care (PHC) especially for refugee people (MOH, 2014b).

1.6.2.1 Secondary Health Care (Hospitals)

The total number of hospitals in the GS is (30) hospital, (13) hospital run by the MOH, (14) hospital belong to the private healthcare sector (NGOs) and (3) hospitals belong to the ministry of interior. the total bed capacity of these hospitals allover GS is (2864) beds, (2107) at the MOH hospitals represent 73% of the total beds , (619) beds at the (NGOs) hospitals represent 21.6% of the total beds and (138) beds at the Ministry of Interior which represent 4.8% of the total numbers of beds (MOH, 2014a)

Shifa Medical Complex

Shifa Medical Complex is the biggest in Palestine. It is located in the west part of Gaza. It was established on 1946, developed over years until it reaches to higher universal level over (45,000 km2), and located on the western side of the middle of Gaza City. It consists of three hospitals: surgery, internal Medicine and maternity. The health services provided to citizens through the three hospitals and include the different patients referred by reception and emergency departments or clinics by primary care. Where it transferred to internal departments or hospital outpatients, review the complex. Total numbers of Beds are (630) and total emergency beds are (50) beds (22) beds were in the surgical emergency department and while total number of employees are about (1487) divided as follows: Nursing (36.5%), doctors (35.6%), administrators and technicians in different disciplines (17.7%). The total number of nurses who work in the ED; s about (29) nurses and the total number of doctors who works at the ED's (12) doctors .The occupancy rate in the complex is about 82% (MOH, 2014a).

European Gaza Hospital (EGH)

Hospital began as a grant of the European Union to the Palestinian people at the end of the first intifada in 1989. In this period, there was not any legal authority so UNRWA

has been assigned to create this hospital by European funded. Since the arrival of the Palestinian Authority as the legitimate authority in the country began a dialogue to transfer ownership of the hospital to the MOH. On October 1997 provides for the transfer of ownership of the hospital to the MOH, that the European Union to complete the necessary funding, and provided that during the transition from an international team. In July 1999, the international team working at the hospital with a local Arab team and effectively ended his work in October 2000 and continued management of the Arab local team. The total number of admissions for the first half year is 7697 case of internal divisions, and increase the number of missions for the year 2010 by 169 cases a monthly rate increase of 28 cases. Bed occupancy rate during the past six months is 94% increase the occupancy rate of 6% for The first six months in 2010 and 19% for the first six months in 2009, (EGH, 2011). Total number of Beds are 246 and while total number of employees are about 781 (MOH, 2014a).

Al Awda hospital

Al Awda hospital is the largest and the most important facility for Union of Health Work Committees. It was established in the most deprived area and was inaugurated in (1997) as the first line hospital in the Northern governorate in the Gaza Strip with a capacity of (75) beds in total and can be extended to (100) beds in case of emergency, the total number of emergency department beds is (12) beds, (2) of them ICU beds. The total number of employees who works in emergency department about (15) employees. The hospital provides health services to all inhabitants in the Northern part of the Gaza Strip (62 km2), with population around (323,000) inhabitant. .The total beneficiaries of Al Awda Hospital in (2012) were (108,321) beneficiaries which represent (33.5%) of the total population of the Northern part of the Gaza Strip. Moreover, Al Awda hospital

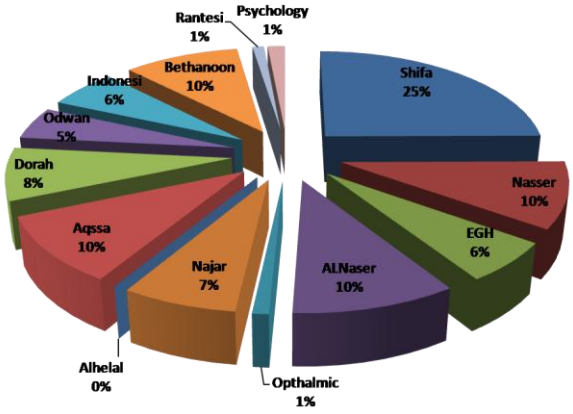
is legitimate to be considering as an educational hospital from some universities in the Gaza Strip to train Nursing students (Union of Health Work Committees, 2014).

Al-Quds hospital

A general hospital provided secondary healthcare services including: surgical, medical pediatric and obstetric healthcare services, the total hospital bed capacity is (100) beds, including (12) emergency beds and the total employees about (232), employee, (35) of these employees working in the emergency department, it located in Tal Elhawa area, at Gaza city, the hospital established in (2000), serves Gaza population (Preliminary PRCS Emergency Appeal, 2014).

1.6.2.3 Emergency health care services

The total emergency beds in GS (274) beds, (191) beds at the MOH, (68) beds at the private healthcare sector hospitals (15) beds at the ministry of interior hospitals. The total number of ED visits during 2014 was (1287720) distributed as follow ; MOH (1171004), NGOs (86126), and ministry of interior (30590) visits. The total number of MOH EDs visits was (1171004) visits (745669) visits ware at the general EDs, (385371) were at the pediatric EDs, and (39964) were at the delivery and gynecology EDs (MOH, 2014a)



Hospital Name	# Beds
Shifa	50
EGH	12
Nasser	20
Najar	14
Aqssa	20
Alnasser	20
Baethanoon	20
Dorah	16
Odwan	10
Indonesi	12
Rantesi	2
Ophthalmic	2
Psychiatric	3
Total	191

Figure (1.1): Percentage distribution of emergency beds at MOH hospitals

The daily EDs visits in 2013 was (1985) cases and 2014 was (2043) cases the differences were (58) cases daily this dramatic increase in daily visits raise alarm to investigate the real causes that standing behind that indicator.

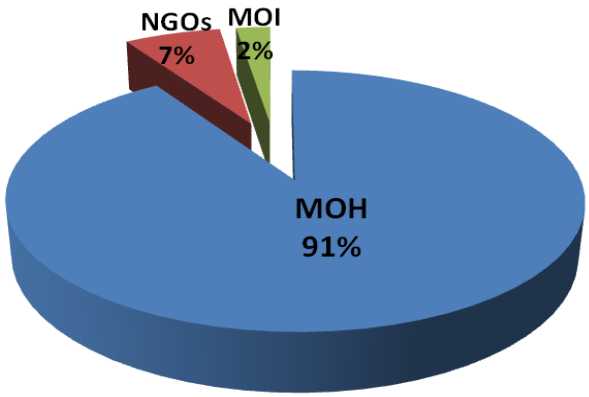


Figure (1.2): Percentage distribution of emergency visits at all health sectors

1.7 The current emergency situation

The current emergency situation in Gaza Strip (GS), is a complex situation including both acute and chronic emergency which linked to the main issue the political conflict, this long standing conflict resulted in a daily aggression and escalation which leads to

dramatic increase in number of casualties, this make a huge burden over the already exhausted healthcare system which face a big challenges including the siege and borders closure which started during the year 2006. This unfair siege dramatically affected the essential recourses needed for sustainability of healthcare system. Moreover, the internal political conflict between the biggest political parties makes the situation more complicated and worsen the situation.

The Israeli Occupying Forces (IOF), use a new war strategy through bombing and shilling the civilian houses which raise the number of casualties, increasing the numbers of martyrs and causes a very bad injuries, these injuries disturb the norms of the healthcare system specially the emergency department in the hospitals, farther more the prehospital Emergency Medical Services (EMS), crew did not have the ability to get access to those at the confrontation areas as a result of assaulting these EMS, personnel preventing them from evacuating the victims making delay from being treated thus a dramatic increase in number of martyrs. In addition to that the IOF, attacks a number of healthcare facilities including hospitals and Public Health Centers (PHC), this issue force the decision makers to start think wisely in using the primary healthcare centers which is already distributed within the population as front line defense and as a strategy for coping with the emergency situation, some international bodies such as MEDECINS DU MOUND (MDM), start some projects to include the PHC, in the emergency response plan in the middle zoon, and conducting a drill by putting the community members, PHC, prehospital EMS, and hospitals all together in order to increase preparedness to cope with emergency situation.

A negative phenomenon noticed in the emergency healthcare in Gaza is that provided almost entirely in hospitals. The unmanageable numbers of injuries in MOH hospitals are a barrier to the provision of timely and appropriate emergency care. Therefore,

strengthening the emergency units within the PHC centers will reduce the overload on hospitals and will improve the chances of providing quality services. (MOH, 2014d)

1.8 Prehospital EMS

The prehospital EMS, in GS play an important role in providing emergency healthcare services for the population and considered one of the important component of emergency healthcare system there are main EMS providers including; Palestinian Red Crescent Society (PRCS), Ministry of Health EMS, Civil Defense (CD), Military Medical Services (MMS), and the NGOs.

For decades This system rely on external donations, reliefs and fund at the same time it faced great difficulties in dealing with huge number of injuries during the Israeli aggressions these difficulties due to lack of resources, lack of needed drugs and equipment, depletion of supplies and failure of equipment as well as restricted and limited fuel supply, all these factors together make a big challenge for the fragile EMS, system, furthermore the blockade and closure of the borders as well as lack of spare parts and maintenance aggravated the situation. Moreover, there are difficulties in getting access to the injured or wounded by the EMS providers and lack of safety in the confrontation areas related to IOF measures and targeting the providers in the field exposing them to a big risk during their mission.

The prehospital EMS is lack of suitable infrastructure including buildings, communication network, and the sustainability of fund and services is a critical issue. The total number of ambulance vehicles working in the emergency field show that at least there are 165 working ambulances in the GS. According to the American standards, the required number of ambulances is 33 per each million, even the total number of ambulance vehicles is reasonable and more than enough but still the quality

of these ambulance vehicles is questionable. (MOH, 2014d). There are different types of triage in the world but the famous one such as Simple Triage And Rapid Treatment (START), Jump triage and Military all these types have the same basic idea and context " Do the greatest good for the greatest number and Maximize survival" it also depends on quick assessment of three main parameters Respiration, Perfusion and Mental status (RPM). Prehospital triage was newly applied as a part of EMS training curriculum in 2000 and performed by the ICRC and the PRCS in 2006 and they used the four colors, but from my point of view it still theoretically applied and we use tags only in simulations and in training drills. Pre hospital triage is so important and it is the first part of the triage chain, which start at the field (scene) and ended at the hospital therefore triage, as a concept should be integrated in the emergency healthcare system as a part of its component in both prehospital and hospital sittings as a continuum.

The first Prehospital protocols was developed around (200-2004) by local expertise with assistant of (MRAM) project and no updating for this protocol since that time. Moreover, there is no single Prehospital protocol accredited as standard one for EMS.

1.9 Operational definitions

Triage system: The process by which a clinician assesses a patient's clinical urgency (Australian Governmental Department of Health and Ageing, 2012).

Triage: is the sorting of patients into priority groups according to their need and the resources available. (WHO 2008). Also, it define as the basic structure in which all incoming patients are categorized into groups using a standard urgency rating scale or structure (Zimmermann, 2001).

In the previous chapter (1), the researcher demonstrates the research problem, justification, setting the general and specific objectives and research questions of the study. In the next chapter (2), the researcher will focus on debriefing for what have been done regarding the research issue of concern (ED triage) throughout assessing the relevant literature, summarizing each source and link it to the research subject, this help the researcher to critically evaluate the existing literature or (published material) for establishing the current knowledge.

Chapter (2) Conceptual Framework & Literature Review

In this chapter, the researcher focus on debriefing for what have been done regarding the research issue of concern (ED triage) throughout assessing the relevant literature, summarizing each source and link it to the research subject, this help the researcher to critically evaluate the existing literature or (published material) for establishing the current knowledge.

2.1 Conceptual framework

Conceptual framework is considered a basic element in the scientific research, it represent the skeleton of study. It connects and clarifies the relationship between the dependent and the independent variables. Through this study, conceptual framework will demonstrate the main framework of the hospital ED, triage system, the different factors that contribute to the triage performance.

Through the diagram illustrated below, will be drown the integration of multifactor's that influence the ED triage outcomes. These factors including: human resources, equipment and technology, structure and design, standards and protocols, and finally the communication and documentations. Each one of these factors have sub-factors category which represent the main inputs for hospitals ED's, All these factors together through the management process of the hospital's emergency departments will lead to the output, which will be either positive (effective ED, triage and thus a good patient outcome) or a negative one. This will reflected through our study analysis results. Hope that at the end of this study we set some important recommendations from our perspectives, that touch the underpinning triage system reality and gives a value to our research study result.

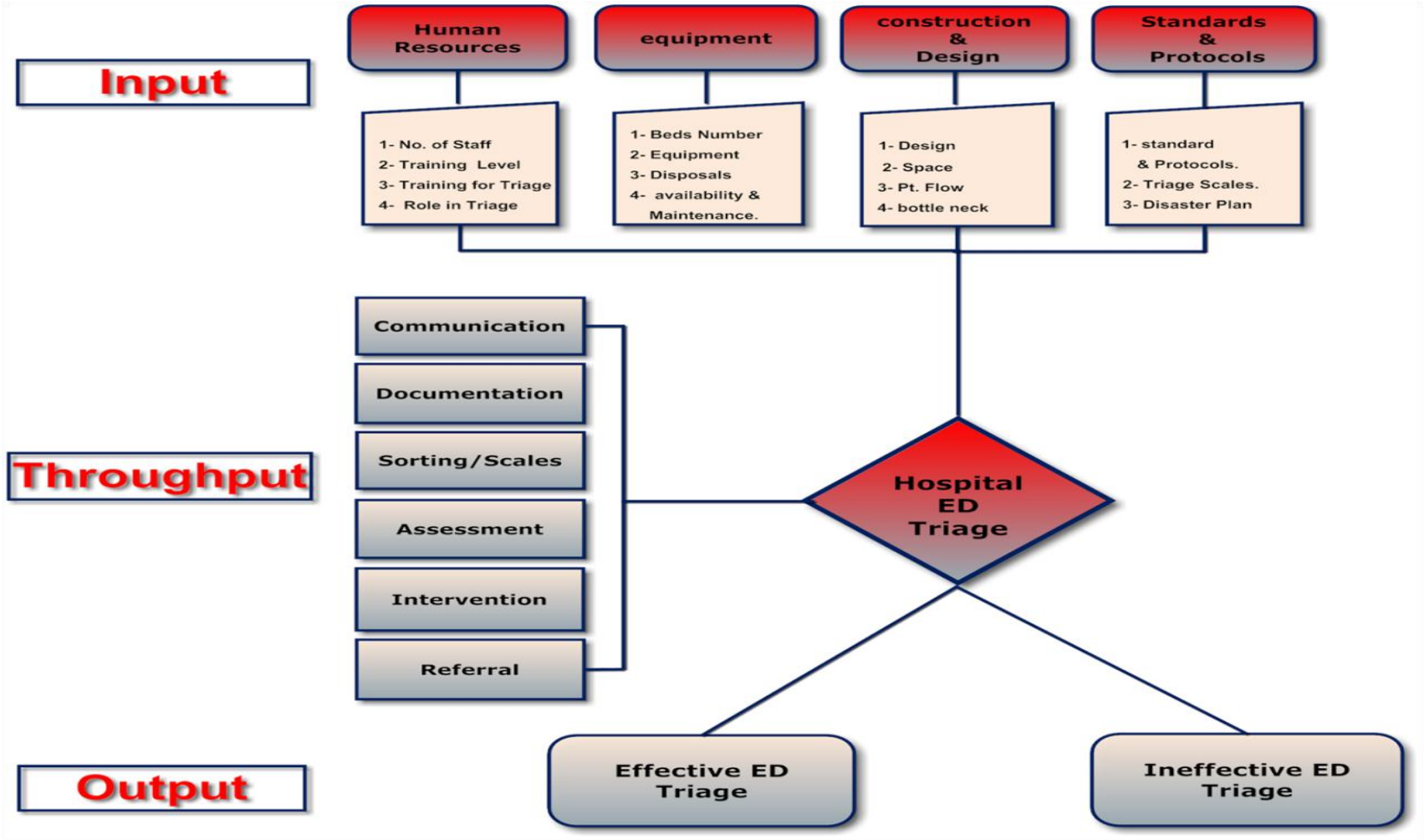


Figure (2.1):Self developed conceptual framework

Dependent and independent variables of the study

The dependent variable of interest in this study is ED triage system, which including severity of injury, time of stay, time for attendance, use of scares resources.

The independent variables compose of personal variables including: socio-economic demographic variables (age, gender, marital status, educational level, monthly income). Moreover, health profile variables (standards and protocols, ED's, structure and spaces and communication and documentation).

2.2 Literature review

2.2.1 History of triage

The triage originate from the French word ‘‘trier’’, and it was originally applied to a process of sorting, probably around 1792, by Baron Dominique Jean Larrey, Surgeon in Chief to Napoleon’s Imperial Guard. Larrey has credited with designing a flying ambulance: the Ambulance Volante. Baron Francois Percy also contributed to the organization of a care system for the ongoing management of casualties. Out of the French Service de Sante´, not only emerged the concept of triage, but the organizational structure necessary to handle the growing number of casualties in modern warfare (Iserson and Moskop, 2007). Triage is a dynamic process in which patient’s condition may improve OR deteriorate during the wait for entry to the treatment area (Charles, 2007).

The original concepts of triage primarily focused on mass casualty situations. Many of the original concepts of triage, the sorting into immediate, urgent, and non-urgent with the use of the holding category in the warfare situation, remain valid today in mass casualty and warfare situations (Stover-Baker, Stahlman and Pollack, 2012). With the development of organized medical systems in the western world, the early 1900s saw

triage emerging in the emergency departments in the U.S., UK, and Europe. Triage at this time consisted usually of a brief clinical assessment that determined the time and sequence in which the patient should then be seen by the limited resources, or, if applied in the field, the speed of transport and choice of hospital destination for initial treatment. Three phases of triage have emerged in modern healthcare systems: First, pre-hospital triage in order to dispatch ambulance and prehospital care resources, second, triage at scene by the first clinician attending the patient and thirdly, triage on arrival at emergency department or receiving hospital.

Triage, by definition, is a dynamic process, as the patient's status can change rapidly. Patients may enter the triage stream at any point for example: patients with critical illness and injury not infrequently walk in to accident and emergency departments. Multiple portals of entry to health care have resulted in the evolution of different systems of triage for telephone contact, ambulance contact, and direct patient entry to hospital or primary care facilities. This diversity of healthcare triage systems is creating difficulties in developing integrated care services. Early triage systems were primarily trauma based, originating as they did from the battlefield situation.

Traditionally, the triage process is an intuitive element of ED nursing practice. Nurses have always reorganized queues to ensure that those unable to wait are seen first. The earliest written record of the use of triage in emergency medicine, in a systematic sense, was in the early 1960s at Baltimore, USA. (Weinerman, et al. 1966). However, this and other early systems lacked formal structure and organization. In addition, there was no agreement on the categories used. Triage was performed by clerical staff or by the patients themselves who were asked to choose whether they wished to attend "Medical" or "Surgical Casualty". Over time, many departments began to introduce more

formalized systems of triage to meet the demands of modern emergency medicine (Advanced Life Support Group, 2002).

Anything from two to 10 categories used to assign patients. At the same time as more formalized systems appeared, there emerged a focus on ED performance. This led to system-wide performance evaluations of the processes and outcomes. These evaluations aligned the need to ensure patients received appropriate, timely and high-quality care with an accurate breakdown of ED workload (FitzGerald et al., 2009).

2.2.2 ED triage

Triage is a process that is critical to the effective management of modern emergency departments. Triage systems aim, not only to ensure clinical justice for the patient, but also to provide an effective tool for departmental organization, monitoring and evaluation. Over the last 20 years, triage systems have been standardized in a number of countries and efforts made to ensure consistency of application. However, the ongoing crowding of emergency departments resulting from access block and increased demand has led to calls for a review of systems of triage. In addition, international variance in triage systems limits the capacity for benchmarking (FitzGerald et al., 2010).

There is a variation and remains a significant inconsistency in triage assessment arising from the diversity of factors that determining the urgency of any individual patient. It is the time to accept this diversity, of what is agreed, and what may be agreeable. It is time to develop and test an International Triage Scale (ITS) which supported by an international collaborative approach towards a triage research agenda. This agenda would seek for further develop of application and moderating tools and to utilize the scales for international benchmarking and research programs (FitzGerald et al., 2010).

There are two significant issues in current triage systems. First, recent frustrations with ED over- crowding due to growing demand and access block have brought the ongoing utility and value of triage systems into question (Kelly et al., 2007 and Ieraci et al., 2008). Second, other jurisdictions (particularly the USA) are yet to adopt a standardized approach. This limits opportunities for international benchmarking of ED performance and experience (FitzGerald et al., 2010).

Triage refers to process of sorting and prioritizing patients for care (FitzGerald et al., 2010), argue that there are two main purposes for triage: "first to ensure that the patient receives the level and quality of care appropriate to clinical need (clinical justice) and second that departmental resources are most usefully applied (efficiency) to this end" (Moskop and Ierson 2007). While current triage systems used around the world address the clinical justice purpose of triage, the efficiency purpose has largely overlooked. For instance, most ED's in Australia use the Australasian Triage Scale (ATS), the Manchester Triage Scale (MTS) is prevalent in the U.K., and ED's in Canada generally use the Canadian Triage Acuity Scale (CTAS). While they differ in their details, all of these triage systems classify patients strictly in terms of urgency and so address only the first (clinical justice) purpose of triage. In the U.S., many ED's continue to use a traditional urgency-based 3-level triage scale, which categorizes patients into emergent, urgent, and non-urgent classes. Nevertheless, other U.S. hospitals have adopted the 5-level Emergency Severity Index (ESI) system (Fernandes et al., 2005), which combines urgency with an estimate of resources (e.g., tests) required. In the ESI system, urgent patients who cannot wait are classified as ESI-1 and 2, while non-urgent patients who can wait are classified as ESI-3, 4, and 5. ESI-4 and 5 patients usually directed to a fast track (FT) area, while ESI-1 patients immediately moved to a resuscitation unit. ESI-2 and 3 patients, who represent the majority of patients at large academic hospitals (e.g.,

about 80% at the University of Michigan ED (UMED), are served in the main area of the ED with priority given to ESI-2 patients. Since the ESI system does not differentiate between patients in the ESI-2 and ESI-3 categories in terms of complexity, patients in the main ED still sorted and prioritized purely because of urgency. Hence, the ESI system does not respond to the second purpose of triage for the majority of the patients.

2.2.3 Purpose of a triage system

The purpose of a triage system is to ensure that the level and quality of care that delivered to the community is commensurate with objective clinical criteria, rather than administrative or organizational need (Australian Governmental Department of Health and Ageing, 2012). In this way, standardized triage systems aim to optimize the safety and the efficiency of hospital-based emergency services and to ensure equity of access to health services across the population. The use of a standard triage system facilitates quality improvement in EDs, because it allows for comparisons of key performance indicators (i.e. time-to-treatment by triage category) both within and between EDs. Since the early 1990s, the use of computerized information systems in Australian EDs has permitted the precise calculation of time-to-treatment against a variety of patient outcomes, including triage code, chief complaint, and diagnosis and discharge destination.

2.2.4 The principles of triage

The principal purpose of ED triage is to ensure that the patient receives the level and quality of care appropriate to clinical need (clinical justice) and that departmental resources are most usefully applied (efficiency) to this end. (Rogers et al., 1999). Clinical justice is based on the premise that patients presenting to EDs have a variety of complaints some very urgent and others relatively not urgent. Clinical justice, including

clinical efficiency, aims to ensure that the patient receives care appropriate to need and in a timely fashion. Triage systems facilitate the initiation of further assessment and treatment, in addition to comfort and reassurance, documentation of patients and their needs, communication with them and their families regarding the nature of their problem and the process of care likely to follow, initiation of infection control procedures and education regarding illness prevention and control (FitzGerald et al., 2009). Not all patients presenting to EDs require the same level of treatment and resources, so a simple head count of patients tells little of the mix of complexity. The growing demand for emergency healthcare, access block, and associated ED congestion adds to the need for a better description of workloads and relative resource requirements. Organizational efficiency is achieved by applying the resources in a timely and appropriate manner, providing information on the diversity of workloads for policy, planning and performance management purposes and providing a means of ensuring quality control, staff support and research. While these may be achieved by less formal approaches, the principal value of formalized triage systems lies in the support provided to staff and the ability to compare and contrast performance over time and with other institutions (Fitzgerald et al., 2009).

2.2.5 The concept of urgency

The concept of urgency is central to triage in emergency medicine. Urgency incorporates concepts of timeliness and is different from severity (Australian Governmental Department of Health and Ageing, 2012). Urgent conditions may not necessarily be severe (e.g., a dislocated joint), while severe illness (e.g., terminal malignancy) may not necessarily be urgent. Both clinical and environmental factors contribute to the urgency of any particular patient. Clinical factors include the nature of the illness or injury, the severity, and symptoms associated with it, the remediability of

the condition to successful intervention and the potential impact of time on the outcome. Thus, a dislocated knee joint with compromised circulation is urgent because of the need to relieve pain, the potential adverse outcome if left untreated and the ability of relocation for rapidly improve both the symptoms and outcomes.

2.2.6 Determination of urgency criteria internationally

Urgency is determined according to the patient's clinical condition and is used to determine the speed of intervention that is necessary to achieve an optimal outcome'. Urgency is independent of the severity or complexity of an illness or injury For example, patients may triaged to a lower urgency rating because it is safe for them to wait for an emergency assessment, even though they may still eventually require a hospital admission for their condition or have significant morbidity and attendant mortality (Richardso, 2004). The urgency criteria assigned to each triage category differ across the world. All triage systems have described based on the consensus opinion of nursing and medical experts. Clinical experts have designed decision trees to support clinical risk assessments or predictions of resource use to define urgency levels.

2.2.7 Function of triage

Triage is an essential function underpinning the delivery of care in all EDs, where any number of people with a range of conditions may present at the same time. Although triage systems may function in slightly different ways according to a number of local factors, effective triage systems share the following important features (Richardson, 2004).

- A single entry point for all incoming patients (ambulant and non-ambulant), so that all patients are subjected to the same assessment process.

- A physical environment that is suitable for undertaking a brief assessment. It needs to include easy access to patients, which balances clinical, security and administrative requirements, and the availability of first aid equipment and hand-washing facilities.
- An organized patient processing system that enables easy flow of patient information from point of triage through to ED assessment, treatment and disposition.
- Timely data on ED activity levels, including systems for notifying the department of incoming patients from ambulance and other emergency services.

2.2.8 Emergency triage scales

Internationally, five-tier triage scales have been shown to be a valid and reliable method for categorizing people who are seeking assessment and treatment in hospital EDs. These scales show a greater degree of precision and reliability when compared with either three-tier or four-tier triage systems. The features of a robust triage system can be evaluated according to the following four criteria: (Fernandes et al., 2005).

- **Utility:** The scale must be relatively easy to understand and simple to apply by emergency nurses and physicians.

- **Validity:** The scale should measure what it is designed to measure; that is, it should measure clinical urgency as opposed to severity or complexity of illness or some other aspect of the presentation or of the emergency environment.

- **Reliability:** The application of the scale must be independent of the nurse or physician performing the role, that is, it should be consistent. 'Inter-rater reliability' is the term used for the statistical measure of agreement that is achieved by two or more raters using the same scale.

- **Safety:** Triage decisions must be commensurate with objective clinical criteria and must optimize time to medical intervention. In addition, triage scales must be sensitive enough to capture novel presentations of high acuity (Zimmermann PG. 2001).

2.2.9 International triage systems all over the world

There are four common accredited triage scales in the world, which includes the (ATS), the (CTAS), the (MTS), and the (ESI). Through this literature the researcher try to brief these four common types of triage scales in order to better understanding the current triage system over the world, trying to get much knowledge about how these system is running and link it with what used her in GS and what scales applied in GS, hospitals.

The Australasian Triage Scale (ATS), formerly the National Triage Scale (NTS)

The National Triage Scale (NTS) was implemented in 1993, becoming the first triage system to be used in all publicly funded EDs throughout Australia. In the late 1990s, the NTS underwent refinement and was subsequently renamed the Australasian Triage Scale (ATS) (Australian Collage for Emergency Medicine, 2013).

The ATS has five levels of acuity:

- Immediately life-threatening (category 1)
- Imminently life-threatening (category 2)
- Potentially life-threatening or important time-critical treatment or severe pain (category3)
- Potentially life-serious or situational urgency or significant complexity (category 4)
- Less urgent (category 5).

The ATS has been endorsed by the Australasian College for Emergency Medicine1 and adopted in performance indicators by the Australian Council on Healthcare Standards.

Canadian Triage and Acuity Scale (CTAS)

The Canadian Triage and Acuity Scale (CTAS) were officially included in policy throughout Canada in 1997. The CTAS has been endorsed by the Canadian Association of Emergency Physicians and the National Emergency Nurses Affiliation of Canada. This scale is very similar to the ATS in terms of time-to-treatment objectives, with the exception of category 2, which is <15 minutes rather <10 minutes as in the ATS (Bullard, et al., 2008)

Manchester Triage Scale (MTS)

The Manchester Triage Scale (MTS) was jointly developed by the Royal College of Nursing Accident and Emergency Association and the British Association for Accident and Emergency Medicine. The MTS differs from both the ATS and the CTAS in that it is an algorithm-based approach to decision-making. (Zimmermann, 2001). The MTS involves the use of 52 separate flow charts that require the decision-maker to select the appropriate algorithm based on the presenting complaint, and then gather and analyze information according to life threat, pain, hemorrhage, consciousness level, temperature, and the duration of signs and symptoms. The MTS requires standard documentation, and this streamlined approach is believed to save time as the documentation is simplified. In addition, the approach is thought to be particularly beneficial for novice nurses because the decision-making process occurs within very well defined parameters.

Emergency Severity Index (ESI)

The Emergency Severity Index (ESI) is a system of triage categorization that is based on both treatment acuity (How soon should a patient be seen?) and resource consumption (What resources is the patient likely to require?). The ESI has been refined

on a number of occasions. (Gilboy, et al., 2011). It has been found to be reliable when tested using written case scenarios21, and is currently being considered for use across the United States of America (Fernandes C, et al. 2005).

2.2.10 Triage system in Gaza

Gaza triage system applied with the cooperation between Ministry of Health and the ICRC, in (2010-2011). It start as a pilot study in Shifa hospital and then generalized to the rest of the governmental hospital, it includes the main hospitals in the governorates. The newly applied triage system still has some ambiguity concerning the commitment of the healthcare provider in applying the system according to the standard that prepared for this system. Moreover, the triage system not officially applied in the private sector hospitals, and these hospitals create their own emergency preparedness plan within the context of the national plan of the MOH. Therefore, this issue make gives the study of a great value since it will evaluate how far the current triage systems serve the goal that it set for.

2.2.11 Triage team

The ED, triage team consists of an emergency physician, an emergency nurse, a scribe, a registrar, a technician and a security or police personnel. Triage is an independent nursing role and essential to the efficient delivery of emergency care. Clinical decisions made by Triage Nurses require complex cognitive processes. The Triage Nurse must demonstrate critical thinking skills and abilities in environments where data available to inform such decisions is limited, incomplete or ambiguous. The ability to formulate judgments and make decisions is critical, and the quality and accuracy of triage judgments and decision-making are central to appropriate clinical care. In some models

of care, triage may include a medical officer in a triage team. CENA endorses the concept that Triage must attend not less than a qualified Registered triage Nurse.

2.2.12 The triage role

Triage decision-making is an inherently complex and dynamic process. Decisions are made within a time-sensitive environment, with limited information, for patients who generally do not have a medical diagnosis (Australian Governmental Department of Health and Ageing, 2012). Due to the multifaceted nature of the triage role, nurses are required to possess specialized knowledge as well as experience with a wide range of illness and injuries. Triage decisions can be divided into primary and secondary categories according to the aims of the triage system. Understanding these decision types is helpful in describing the roles and responsibilities of the Triage Nurse in actual practice.

Primary triage decisions' relate to the establishment of a chief complaint and the allocation of urgency. When a triage code is selected there are three possible outcomes (Australasian College for Emergency Medicine, 2010):

- **Under-triage** in which the patient receives a triage code that is lower than their true level of urgency (as determined by objective clinical and physiological indicators). This decision has the potential to result in a prolonged waiting time to medical intervention for the patient and risks an adverse outcome. (Fernandes C, et al.,2005).

- **Correct (or expected) triage decision** in which the patient receives a triage code that is commensurate with their true level of urgency (as determined by objective clinical and physiological indicators). This decision optimizes time to medical intervention for the patient and limits the risk of an adverse outcome (Fernandes C, et al., 2005 and (Considine, Le Vasseur and Charles, 2001).

- **Over-triage** in which the patient receives a triage code that is higher than their true level of urgency. This decision has the potential to result in a shortened waiting time to medical intervention for the patient; however, it risks an adverse outcome for other patients waiting to be seen in the ED because they have to wait longer (Fernandes C, et al., 2005 and (Considine, Le Vasseur and Charles, 2001).

The Triage Nurse makes urgency decisions using clinical and historical information to avoid systematic under- or over-triage. 'Secondary triage decisions' are concerned with expediting emergency care and disposition.

The Triage Nurse employs locally based policies and procedure to expedite care for all patients where appropriate. All patients in the waiting room must be reassessed by the Triage Nurse once the triage time has expired. This second assessment should always be documented in the patient's notes. (Charles, 2003).

2.2.16 Triage Ethical Dimension

All ethical principles refer to the individual treatment of patients under regular circumstances. However, in disasters, where there is an acute and unexpected imbalance between the capacity and resources of the medical profession and the needs of survivors, the regular processes of treatment can no longer apply for they cannot be fulfilled (Anderson-Shaw, Ahrens and Fetzer, 2007). The sheer number of injured or ill may overwhelm the capacities of medical res- ponders who therefore must establish priorities as to who should be treated and in which order they should be treated and/or transported. It is not possible with a limited number of qualified responders with inadequate equipment and transport capabilities to attend to the needs of all simultaneously. Each casualty encountered must be assigned a priority for field treatment and evacuation or transfer. Thus, the injured and/or ill each are sorted into

groups according to pre-established priorities. This process is called triage, (Gunn, 1990).

The performance of triage must be avoided whenever possible and when it needs to be applied, it raises important ethical issues, as acting according to priorities means that individual interest must respect the interests of the mass of victims. Hence, the above-mentioned principle of the Declaration of Helsinki concerning the interest of the subject, which is supposed to prevail over the interest of the society, can under these circumstances not be followed. Individual medical care needs to be given up in order to conduct a disaster medical approach. In disasters the physician, while remaining responsible for the wellbeing of each of the victims, must on the other hand decide who should get help urgently with regard to the outcome, i.e. survival. In 1994, the World Physician Association released a statement on ethics and disaster medicine that declares that under disaster condition it is agreed to abandon one's commitment of treatment of a single person in favor of stabilizing vital functions of many patients. It continues to point out that it is unethical for a physician to persist, at all costs, at maintaining the life of a patient beyond hope, thereby wasting to no avail scarce resources needed elsewhere. Therefore, Disaster Medicine should keep in mind that the technical and medical resources sometimes are limited, as is often the case in situations involving mass casualties. Under such circumstances, the immediate availability of optimal medical supplies according to the standards valid in individual medicine cannot be guaranteed for every patient. The unusual situation compels the physicians to provide the best supply of the available forces and resources for as many patients as possible. In order to achieve this, a category of urgency must be implemented and should be divided into a sequence of priorities. Herein, the physician's decision should always follow the above-developed ethical guidelines for conduct in as far as possible, for example, the

principle of informed consent should be stuck to in as far as ever possible. Even and especially in disasters, the physician needs to demonstrate the highest degree of personal moral integrity and responsibility (Domres, 1991).

2.217 Evaluation of triage system

After the researcher demonstration the literature review, studies, books, and publication related to the context of this study (evaluation of triage system), the researcher found that most of these studies raise a need that aimed for evaluation of triage system and triage process focused on the following common domains; structure and design, human resource, equipment and machines, registration and documentation, communication, and standards and protocols.

Structure and design

The main hospital entrance easy accessible located at the main street with one way direction towards the hospital to prevent busy traffic, there should be two separated gates one entrance and one exit with clear signage and way finding to the ED, there should be enough place with shade for ambulance vehicles and private cares to load and drop off patients for short term parking as well as assigned enough parking place near by the main ED entrance, the entrance should have two separated gates one for patients arrived by ambulance or private cars through which patients brought on trolley and one for walking patients, providing pathway for disabled patients on wheel chairs, there is a designated place closed to ambulance by for enough number of trolleys wheel chairs stretchers and other equipment needed for carrying, lifting and transporting patient and injured with a place to wash these equipment when needed (WHO, 2007) . Close to the main ED entrance there is the registration office and administrative services including; registration office, security staff office, public information office , coworker office (The Australasian College for Emergency Medicine, 2014).

The structure and design is one of the main determinants of any ED and one of the important considerations in planning the physical structure of ED should include safety and security, provision of amenities, access, and meet the user's expectations, and evolving good practices. Security is a common issues in all ED, and the demand increased when there is expected eruptions of violence by patients and those accompanying them, exacerbated during events of mass causality specially when large number of people rushing to ED, some security measures have to be done to prevent such predictable and unpredictable violence and even crimes, and some of the most relevant security recommended measures includes the following, ED external design should take in account that the ED opened 24-hours and the public congregate around it at all times of the day so the external design needs to be designed in such a way that there was no areas in which people can hide, or that these areas are limited; Instillation of security control cameras in visible locations is needed (Department of Health UK, 2013). It has been suggested that having an additional monitor facing the patients gives them a stronger visual cure that they are being observed and are accountable for their behavior; presence of security staff at the ED, is insisted at all times 24-hours/7days; providing clear communication methods including duress alarms throughout the ED, including in ambulance bays; Physical barriers to aggression – such as , glass screens for triage and clerical staff. These unfortunately have the potential to make communication more difficult; well-maintained facilities; clear verbal and signed communication and way finding, to mitigate anxiety; furniture with minimal sharp edges and well-secured; and Access points to clinical areas should be controlled, with suitable numbers of guards with specific elegant uniform (Ulrich and Zimring, 2004).

In addition to security, one of the best initiative that considered with patient initial assessment is the proper disposition of patient separating who present at the ED into

two separated flow-streams based on predicted disposition such as admission vs. possible discharge, through which each stream is treated in separate locations, will lead to decrease length of stay at the ED (Ben-Tovim et al., 2007). This strategy effective since the admitted patients require more time and management in ED than those who are predicted to be discharged despite that some of those discharge patients may require to stay long time as a result of their conditions before being discharged (Kelly, et al., 2007).

Streaming is also another model of care which based on complexity of ED care that participate in decreasing patients LOS at the ED, streaming patients into two complexity streams – fast track patients with low complexity conditions that require low nursing involvement, and the remaining presentations that require greater nursing involvement by which patients were streamed directly to a secondary waiting area for ongoing monitoring and treatment by the care team. This streaming approach has been found to be effective in EDs (Institute for Clinical Evaluative Sciences, 2010).

Human resource

Most EDs have a common Factors that affecting the triage role these factors includes ED activity increased as an exception at the afternoon shift which considered the busier period of the day where there is a need to increase the number of staff in these EDs with high activity through providing additional support at the triage area on the afternoon shift. Continuous education programs and training opportunity were provided for the nurses who work at the EDs regarding triage. Nurses with more years of experience were assigned to perform triage and this efficiently affecting performing the triage implementation in a timely manner for all patients' categories and gathering more information affecting their decision making for sure but takes longer timeframe for

performing some measures and interventions, such as assessing their vital signs causing interruptions and delays (Richardson, 2009)

Performing in the role of triage requires a specific level of knowledge, skill and experience, and an ability to make complex decisions using clinical reasoning. The triage process requires extensive knowledge and experience to deal with the clinical and resourcing complexities. Education and succession planning are therefore an important part of facilitating and maintaining a sufficient supply of skilled triage staff in EDs (Considine, Botti, and Thomas, 2007). In addition to nurses experience, awareness the community, patients, and their attendance introducing the triage process and explaining the importance of triage concept to them is very important factor and have a positive effects on those patients who waits longer time tell they received the care in addition there should be clear and enough concise signage to help patients find their way as well as provide information about what they will expect in an ED and at triage (Ontario Hospital Association, 2010).

Equipment and machines

The triage area is designed for quick assessment and simple interventions performed by the triage nurses therefore not that much equipment required but some equipment needed such as; mobile patient assessment and monitoring equipment, equipment and medications for simple treatment measures, a triage assessment room incorporating (nude weight) baby weighing facilities, wheelchairs and emergency trolley, communication system, electronic information entry portal either computer terminal or hand held device. Security and duress alarms (Australasian College for Emergency Medicine, 2014 and Australasian Health Infrastructure Alliance, 2012).

Registration and documentation

This area is assigned for patient registration at the reception area allows for the electronic recording of the personal details of presenting patients after triage. This information is required for production of the necessary paperwork and patient labels, for the current episode of care. At reception, hard copy medical records are also retrieved. The size of this area governed by the number of reception work stations required for patient census. The functional requirements of registration area includes; dedicated registration area co-located with triage, access to an electronic patient information entry portal , mechanisms to ensure privacy for disclosed patient details and/or displayed patient information, security of staff from any aggressive patients, duress alarm, use of mobile registration at the bedside using mobile devices or bedside computer terminals. Registration area has spatial relationships with hospital archives and medical records if they are not electronic, relationship to a Triage Nurse, either as a triage and a registration combination, or a separate area for registration but only following triage, the registration clerk for some instant is responsible for regulating entry and exit to the ED, the design must allow for clinical staff to have a clear line of sight with the reception area.

Communication

Communication is one of the main components of any emergency healthcare system since a clear, accurate and timely communication is necessary to ensure informed decision-making, effective collaboration and cooperation, within the ED, the other hospital departments and the external world. Ensure the availability of reliable and sustainable primary and back-up communication systems (e.g. satellite phones, mobile devices, landlines, intercom, Internet connections, pagers, two-way radios, and unlisted

numbers), duress alarm for security call as well as access to an updated contact list (WHO, 2011).

Finally, in this chapter we shed light in the literature related to the triage system and ED, function, role of triage teams, common type of triage worldwide, and evaluation of triage system. In the next chapter we will discuss the methodology needed in this study.

In the previous chapter (2), the researcher focused on debriefing for what have been done regarding the research issue of concern (ED triage) throughout assessing the relevant literature, summarizing each source and link it to the research subject, this help the researcher to critically evaluate the existing literature or (published material) for establishing the current knowledge. In the next chapter, the researcher will focus on research methodology which includes: study design, study population, time of study, sample size, eligibility criteria, instrumentation, pilot study, data collection, data entry and analysis, ethical considerations, and finally limitations of the study.

Chapter (3) Methodology

In this chapter, the researcher will present the study methodology which includes: study design, study population, time of study, sample size, eligibility criteria, instrumentation, pilot study, data collection, data entry and analysis, ethical considerations, and finally limitations of the study.

3.1 Study design

The design of the study is a descriptive analytical cross-sectional one. Mixed methods include both qualitative and quantitative data collection approaches. The cross sectional design is appropriate for description of the practice and its relation to other variables. The quantitative part will describe and measure the current triage system, which help us to identify the weaknesses and the strengths in the current health care system. The in-depth interviews help in understanding and interpreting the real causes of the problem through the understanding of the key people's perceptions and attitudes to strengthen and enrich the study outcomes.

3.2 Settings of the study

The study was conducted at the ED in four hospitals (Al-Shifa, Gaza European Hospital (GEH), in addition to two private hospitals (AL-Awda and AL-Quds hospital)

3.3 Period of the study

The proposal was prepared in May2015. Ethical letter was sent to the general director of MOH in Sep. 2015, and approved in October, 2015. Then the pilot study was conducted in the second half of January 2016. Actual data were collected from February 5, 2016 until the March10, 2016. Then, the questionnaires were checked out for completeness, then coding and entering onto the computer by the end of March15. Statistical analysis and thesis writing were completed by the end of March 2016.

3.4 Study population

The study population included 290 health care providers; doctors, nurses, administrative, and security team who work in the targeted (4) hospitals ED is in which the triage system is applied. The researcher considered the population as the sample of study (census). Twenty providers participated in the pilot study and included in the actual sample. The total number agrees and filling the questionnaire was 252 with response rate 86.8%.

Table (3.1) Distribution of study population by hospital

Hospital	Population
Al-Shifa	150
EGH	85
Al-Quds	30
Al-Awda	25
Total	**290**

3.5 Eligibility criteria

3.5.1Inclusion criteria

Inclusion in the study will be the hospital administrative level personnel who involved in the decisions making process regarding applying and monitoring the triage system.

Regarding the qualitative part, it has in-depth interviews, which conducted with the health providers. In particular the directors, head of ED's, of the (4) hospitals (Shifa, Gaza European Hospital (GEH), in addition to two private hospitals (AL-Awda and AL-Quds hospital) were the triage system was applied

3.5.2 Exclusion criteria

We excluded the volunteers to prevent bias since they have limited experience in the field of practice in the ED. In addition, we excluded the international institutions that support-applying triage in the MOH, hospitals (ICRC), the aim of this exclusion is to

prevent the expected bias, since they will be strongly committed to defense the current applied triage system.

3.6 Ethical and administrative considerations

The study respected the internationally recognized research ethical principles. An ethical approval obtained from Helsinki committee (Annex 3). The researcher obtained an academic approval through the school of public health at Al-Quds University to conduct the study (Annex 4). In addition, the researcher obtained administrative approval from General Directorate of Hospitals (Annex 5). For confidentiality and anonymity purposes, Informed consent obtained from healthcare providers and explaining to them the purpose of our study their voluntary participation of this study (Annex 2).

3.7 Construction of the questionnaire

The quantitative data has been collected through self-administered and well-structured questionnaire. The questionnaire designed with reference from those concepts mentioned in the conceptual framework. The following items were included in the questionnaire (Annex 6): the expected filling time for questionnaire is about 20 minutes.

- Socio-demographic and economic data
- Knowledge about ED triage system and what is the main criteria and component (score system).
- Compliance of the current system with the main international triage standards and guidelines.
- The role of the ED's healthcare providers in implementing the standards of the ED triage system.

- The accessibility to triage area and availability of resources in the ED's used to facilitate the triage flow process.
- The equitability of the ED triage system for patients both urgent and non-urgent.
- The strength and weakness aspects of the current triage system.
- Likert's scale questions for three options (Relevant, somewhat relevant, and not relevant).

Key Informative interview, to cover the qualitative part of this study a semi-structured questionnaire with the executive hospital managers, head of the ED's and key persons in the targeted hospitals of the study, as well as the international representatives of the study issue of concerns done by using the qualitative design approach for data collection, review, understanding and interpretation. Throughout constructing guiding questions, the interviews will cover all aspects of our study issue these aspects including (Annex 7):

- The current scope of practice for ED triage system.
- The challenges and barriers that affect application of the triage system, How to improve the performance of the current system from the interviewee perceptions, and
- How the Current TS improve the quality of emergency services in term of time effort and urgency.

3.8 Validity Reliability

Questionnaire reviewed by experts (Annex 8) to assess its relevance and layout. As well as its organization applicability to the study taking in consideration their comments and suggestions to improve the relevance and validity of our questionnaire in addition to

that we conducted a pilot study to test the relevance of the questionnaire and by this way we can overcome any technical problems that may appear.

Furthermore, to insure reliability of the previous measuring tools we considered the following steps: being sure of filling the questionnaire properly. Filling the data and data entry will be at the same day of our data collection. By this way, we will be sure about the quality of our data collection discovering any mistakes or wrong data entry thus an appropriate intervention done soon, and following the rules of proper data entry will maximize the reliability and give more trust for the outcomes of our study. Reliability Cronbach' alpha test will be done by SPSS test the questionnaire items reliability. In this study, Table (3. 1) showed the total reliability test was high as 0.952. Reliability presented as Cronbach alpha reliability coefficient. Usually its value is acceptable if it was more than 0.7.

Table (3.2) Triage system domains reliability

Triage system domains	Number of items	No. of cases	Reliability (Cronbach alpha)
Structure and design	17	182	0.946
Human resource	9	182	0.947
Equipment and machines	9	182	0.949
Registration and documentation	13	182	0.950
Communication	6	182	0.944
Standards and protocols	17	182	0.941
Overall triage system scores	**71**	182	**0.952**

3.9 Pilot study

After considering the perspectives of the field-related specialists, a pilot study was conducted on 10% of total sample size from the four hospitals ED's. The goals of the pilot study were to assess the adequacy of the data collection plan, to explore whether respondents understand the questions on the same way, to minimize the

problems which may be raised during data collection, to identify all domains and components of instrument. Each care providers were asked to respond to the questions in the questionnaire and to indicate if there were any difficult confusing and/or ambiguous questions. Results from the pilot study pointed that the questionnaire would provide the needed data to meet the purpose of the study without major modification. As a result of the piloting, some questions were rephrased.

3.10 Data collection

Data collection has done by two methods the first one through self-administered questionnaire by the study subjects. The second one was in-depth interviews conducted by the researcher with the key persons, decision makers who involved study sample. The researcher expect high response rate exceed 90% which is complying and fulfilling the requirement for conducting this study.

3.11 Data entry and analysis

For quantitative part: the collected data were analyzed using SPSS software program (windows version 20, SPSS, Chicago, USA).Many different statistical tests were used, through frequency of the study factors and description of the study population. Analysis included frequency tables, cross tabulations, pie chart and coding of data to disseminate the study factors. It followed by testing reliability and validity of the instrument. After that, advanced statistical analysis conducted to explore the potential relationships between variables. Therefore, independent sample t-test and one-way ANOVA used to investigate the relationships between the independent study variables with the total and sub-scores of the perception level. Recoding done as needed for continuous variables and for amalgamating certain categories. Scale related questions pertaining to the perceptions about triage system domains computed and transformed into scores. For

each domain and by using account order in the SPSS, the positive questions was coded as "relevant=3",“somewhat relevant= 2” and "not relevant=1". Then the percentage derived and frequencies for the numeric variables conducted as percentages.

For qualitative part: the open coding thematic analysis method used to analyze the transcripts of the in-depth interviews. The researcher would obtain the main findings from the transcripts of the interviews. Then, categorization, comparison and integration of related ideas between the quantitative and qualitative findings were done to enrich the findings of the study and provide a good reflection for these findings in the presentation of our research study.

3.12 Limitations of the study

The limitations faced the researcher in conducting his study were limited of up-to-date and new data sources including books, journals and publications, Limited data base about the emergency care services in GS, and the time and place factors and arranging for the interviews according to interviewees agenda,

In the previous chapter (3), the researcher focused on research methodology that includes: study design, study population, time of study, sample size, eligibility criteria, instrumentation, pilot study, data collection, data entry and analysis, ethical considerations, and finally limitations of the study. In the next chapter, the researcher will present the study results.

Chapter (4) Results &Discussion

This study conducted to evaluate the ED triage system in GS hospitals emergency departments, using structured tool to assess the aspects of provided triage system. This chapter presents the results of the statistical analysis of the data and the interpretation of these results. Descriptive analysis represents the demographic and occupational characteristics of health care providers in the ED. In addition, findings of the identified main dimensions of health care provider's perception with triage system at MOH, EDs, were presented. Moreover, the differences pertaining to the key variables in reference to perceptions' scores were explored.

4.1 Descriptive analysis

Demographic and occupation related findings

From Table 4.1, mostly male health care providers dominated the sample and represented 90.1%. This is mainly related to nature of work in the ED and distressful work environment and work load which is not suitable for female providers especially when it comes to safety issue.

The majority of health care providers were 20-30 years old and more. Providers with age more than 41 years represented 27.0% then the percentage has increased to 31.3% for age group 31-40. The highest percentage was for age group 20-30 years 41.7%. This may related to the policy of MOH in staffing the ED with newly assigned health care providers especially doctors as a part of their rotation in ED.

Half of health care providers worked in at Al-Shifa hospital, which constituted 50%, followed by EGH (28.6%), while Al-Quds and Al-Awda hospital was the lowest 10.7%. This could be due to the position of Al-Shifa Hospital as the main and biggest governmental hospital in GS; it provides services to patients from the North

Governorate to the Mid Zone Governorate including Gaza Governorate. Furthermore, this finding compatible with MOH statistic report in 2015.

Table (4.1) Distribution of responses by demographic and occupation related data

Variables		Frequency	%
Gender	Male	227	90.1
	Female	25	9.9
	Total	**252**	**100**
Age	20-30 years	105	41.7
	31-40 years	79	31.3
	More 41 years	68	27.0
	Total	**252**	**100**
Work place	Al-Shifa	126	**50.0**
	Al-Quds	27	**10.7**
	EGH	72	**28.6**
	Al-Awda	27	**10.7**
	Total	**252**	**100**
Governorate	North Gaza	45	17.8
	Gaza	98	38.9
	Middle	47	18.7
	Khanyounis	35	13.9
	Rafah	27	10.7
	Total	**252**	**100**
Occupation	Physicians	97	38.5
	Nurses	85	33.7
	Administrators	36	14.3
	Securities	34	13.5
	Total	**252**	**100**
Educational level	Secondary and less	28	11.1
	Diploma	50	19.5
	Bachelor	138	54.8
	Master	25	10.1
	PhD	11	4.5
	Total	**252**	**100**
Years of experience in hospital	Less 10 years	172	68.3
	Equal and more 10 years	80	31.7
	Total	**252**	
Years of experience in ED	Less and equal 5 years	156	62.0
	More than 5 years	96	38.0
	Total	**252**	**100**

Health care providers who lived in Gaza Governorate were the highest number 38.9% while Rafah Governorate was the lowest 10.7% as illustrated in Figure 4.2. These findings reflect the good recruiting policies taking by MOH for the benefits of emergency handling to make easy access of health care providers to their workplace including easy call in disaster situation. As well as the result of the current financial crisis, that face local government forces them to redistribute human resources according to their place of residency. The lowest percentage observed in Rafah, which attributed to demographic distribution of EGH staff, which is mainly from Khanyounis and other governorates.

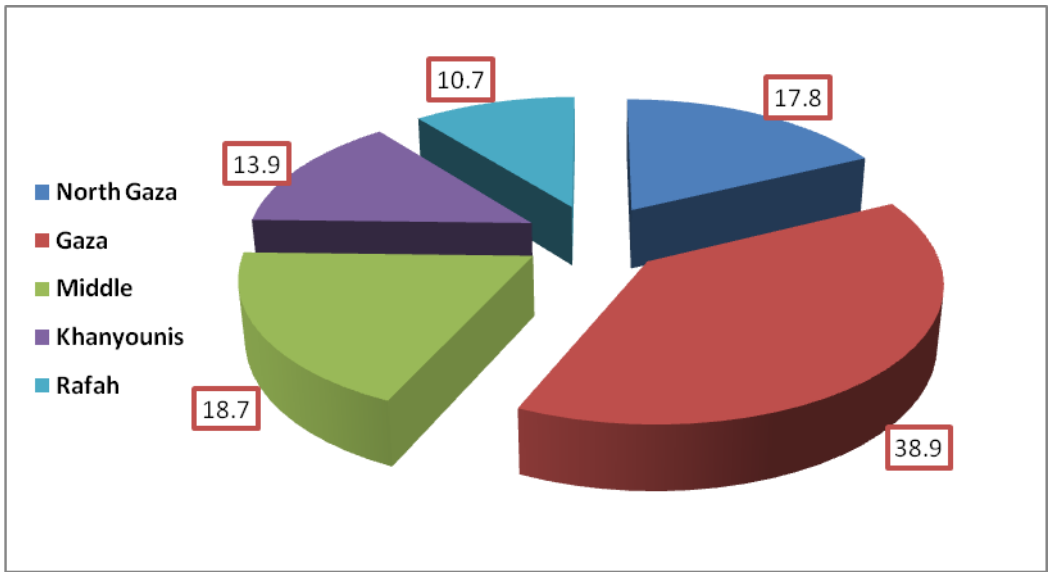


Figure (4.1) Distribution of providers by governorates

Thirty-eight and half percent of participants worked in ED was physician, followed by nurses, which represent 33.7%. The lowest staff was among security and administrator staff, which represents (13.5%-14.3%) respectively as illustrated in Figure 4.2. The researcher attributed this high percent of doctors reflecting the hard truth that there is no fixed emergency team assigned to work in the ED specially doctors and to some extent this problem less appear in nurses. This could be the result of a rotation policy for doctors in ED.

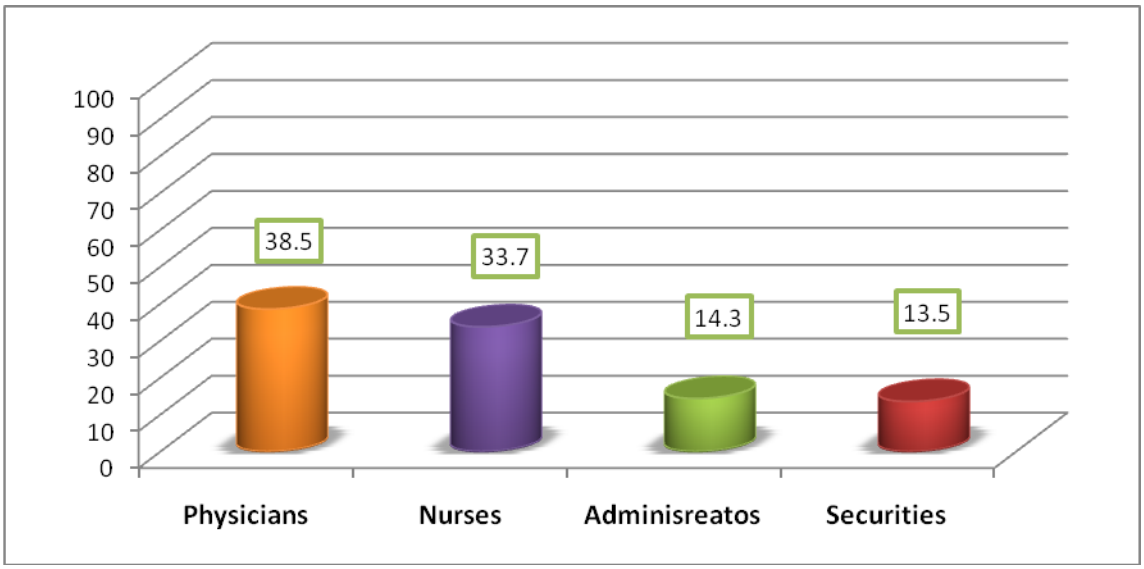


Figure (4.2) Distribution of providers by occupation

More than half of study participants (54.8%) hold bachelor degree, 19.5% hold diploma degree, and 14.6% have postgraduate studies (master or PhD). The security staff whose have only secondary and less degree, which represent 11.1%. The This result reflected the nature of the work in secondary health care which needs higher number of qualified nurses with bachelor degree and fewer number of providers who have diploma degree. Moreover, the staffs with postgraduate degree including master and PhD they do not prefer to stay working in ED under these stressful work circumstances and absent of promotion and good salaries. While they can gain more if, they work in different places like the private sectors.

Table (4.1) showed that 68.3% of the study participants have been working in the hospital for less than 10 years. In addition, 62.6% of the participants have been working in the ED for 5 years and less. This result indicated that the majority of study participants have less years of experience in ED. The researcher attributed the findings to that most doctors who work at the ED are GPs (General Practitioners) with limited years of experience (less than 5 years). While doctors with more experience and having master, PhD degree or emergency Board intended to leave EDs, for many reasons. This

dilemma related to many factors that clearly appear during interviewing the senior staff. We can conclude it in the following: working in the ED is a stressful environment, workloads and overcrowded, bad working conditions, exposure to job risk, bad salaries no incentives or promotion, lack of security and feeling unsecured, adversely affecting their life style and social family interrelationship, no good training opportunity, and no good retention strategies. All these factors together forced the staff to leave the EDs looking for chance to better opportunity in another places.

4.2 Overall perceptions of triage system domains (Physicians and Nurses perspectives)

The researcher assigned scores to the responses with giving higher score to relevant conditions/responses and lower scores to things that are not relevant. After grouping the questions for each aspect and computing them (the scores), a mean percentage is revealed with higher mean percentages indicating favorable conditions and vice versa. The overall mean percentage for all triage system domains scores ranged from 62.3% to 68.0% (Table 4.2). The highest mean score was for registration and documentation domain (13 questions) which reflects positive perception toward them. The lowest level was for the standards and protocols domain, and the overall mean percentage reflecting all scores was 63.7%, which regarded as not high.

Table (4.2) Descriptive statistics of health care provider's important points allocated to the six-triage system dimensions.

Triage system domains	Number of items	Mean	Standard deviation	Weighted %
Structure and design	17	1.872	0.520	62.4
Human resource	9	1.870	0.492	62.3
Equipment and machines	9	1.924	0.622	64.1
Registration and documentation	13	2.041	0.559	68.0
Communication	6	1.961	0.593	65.3
Standards and protocols	17	1.851	0.570	61.6
Overall triage system scores	**71**	**1.912**	**0.483**	**63.7**

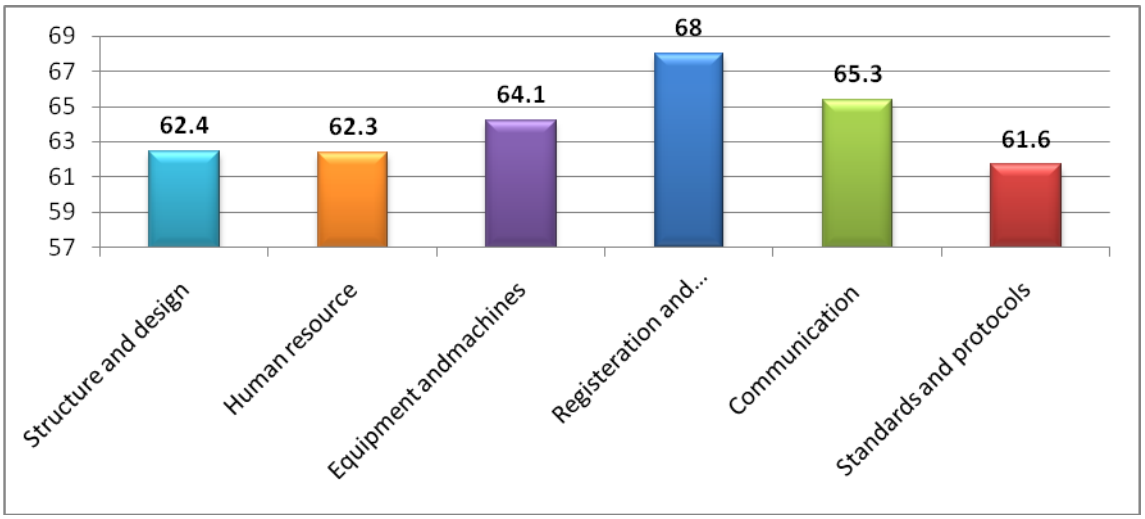


Figure (4.3) Triage system domains and their mean percentages

4.2.1 Structure and design domain

The hospital and EDs design is an important factor that facilitates and enhances the triage process lead to better performance through making the patient flow process and journey in the ED smooth and easy. The main hospital entrance easy accessible located at the main street with one-way direction towards the hospital to prevent busy traffic, there should be two separated gates one entrance and one exit with clear signage and way finding to the ED (WHO, 2007). The researcher included 17 items in this aspect to describe the structure and design of triage system for health care provider's perspective. The elicited mean score for structure and design domain percentage was 62.4%. It reflects that the structure and design domain did not complying the international standards of hospital ED.

Table (4.3) Distribution of responses in reference to structure and design related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted %
Does the current structure and design of the ED's facilitate triaging the patients and injured people?	63.3	41.8	22.0	2.14	0.75	71.3
Dose the surface area assigned for triage area facilitate the flow of patients and injured people?	23.1	47.8	29.1	1.93	0.72	64.3
Does the current surface area assigned for triage have enough capacity to triage a big number of causalities?	15.9	30.2	53.8	1.62	0.74	54.3
Is there another place beside / near by the triage area being used for triage in major events and war situations؟	26.9	25.8	47.3	1.79	0.83	59.6
Does the current hospital and it's ED, design allow for free movement of ambulance vehicles in one way direction (separated entrance and exit pathway)?	20.9	31.3	47.8	1.73	0.78	57.6
Is there a separated ED, entrance from hospital entrance?	41.8	20.9	37.4	2.04	0.89	68.0
Is there a separated entrance for those patients transported by ambulance vehicles and those who transported by private cars?	29.1	23.6	47.3	1.81	0.85	60.3
Is there a separated entrance for those patients transported by foot?	34.1	19.2	46.7	1.87	0.89	62.3
Are there enough places in front of the ED, allow for transitional parking for ambulance and private vehicles to off and load patients and injured people?	29.7	29.7	40.7	1.89	0.83	63.0
Is there a place at the entrance bay close to ambulance parking area designed for storing equipment such as (trolleys, stretchers, wheel chairs) that needed for patients and injured transportation and handling?	22.0	41.2	36.8	1.85	1.75	61.6
Is there enough protection measures provided by police or security personnel in the triage area for the staff, patients and attendance in case of violence eruption?	18.1	39.0	42.9	1.75	0.74	58.3
Is there enough control from the police or security personnel at the entrance, exit, corridors and the elevators at the ED, as well as the hospital?	26.4	34.1	39.6	1.86	0.80	62.0
Does the current ED, design provide a quick access to other areas and parts inside the ED, and the hospital such as " ICU, OR, Imaging and Lab services"?	25.8	47.3	26.9	1.98	0.72	66.0
Does the triage area has enough and suitable place for patients, injured and their relatives until they received the care?	18.1	44.0	37.9	1.80	0.72	60.0
Do you have enough signboards, signage, posters at the hospital, emergency department entrance and the triage area to guide the patient's and their families?	27.5	39.0	33.5	1.93	0.78	64.3
Does the current design of ED, and triage room allow fast tracking of patient at the different stages of interventions؟	25.3	47.8	26.9	1.98	0.72	66.0
Is there a reviewing for the designation of different ED's areas and surveying the ED's staff opinion in particular and the hospital staff in general?	18.7	29.7	51.6	1.67	0.77	55.6

According to the table 4.3.The highest percentage was observed in items "Structure and design of the ED's facilitate triaging the patients and injured people" with 71.3%, the researcher attribute high percent to the intervention which take place by ICRC and MOH decision maker on the reconstruction process that had been done in some hospitals EDs. While the lowest percentage was observed in many items, for example: the item "Does the current surface area assigned for triage has enough capacity to triage a big number of causalities" reach the lowest percentage 54.3%. This finding is not in line with Australian Collage for Emergency Medicine (2014). that mentioned the size of a triage area should be governed by the maximum number of triage staff expected to be present at any given time, in proportion to patient census (Australian Collage for Emergency Medicine, 2014), moreover a study conducted in Jordan reveled expanding ED capacity to manage more patients and meet the increasing demands on services (Nasir, 2014).

4.2.2 Human resource Domain

The human resources considered the core component of any vital system. Trained them, keeping them motivated and fulfilling their needs, will make them satisfied and enhance their performance leads to better outcomes. Human resource domain included nine items that perceived to reflect the most concerned issues in this aspect. The study revealed that the mean score percentage for human resource domain was 62.3%. It reflects that perspectives of health care providers about human resource issues were not high. The researcher attributes this percentage to several factors such as the truth that no fixed emergency team assigned to work in the ED. This dilemma has many dimensions clearly appears through the interviews with the senior staff which concluded in the following: working in the ED is a stressful environment, workloads and overcrowded,

bad working conditions, exposure to job risk, and bad salaries and no incentives or promotion.

Table (4.4) Distribution of responses in reference to humane resource related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted %
Are there enough number of doctors to cover the work at the ED, 24hr./7 days a week.	28.0	36.8	35.2	1.92	0.79	64.0
Does All medical specialties are available 24hr./7 days a week.	26.4	46.2	27.5	1.98	0.73	66.0
Are there enough number of nurses to cover the work at the ED, 24hr./7 days a week.	25.8	37.9	36.3	1.89	0.78	63.0
Is there enough number of well-qualified professional nurses to cover the work at the triage area?	25.8	40.1	34.1	1.91	0.77	63.6
In emergency situations and big events that involved a big number of causalities, Does they provide support with additional staff for triage area?	37.9	46.2	15.9	2.21	0.70	73.6
The technical and administrative crews received the suitable and enough training to perform the triage process.	22.5	45.1	32.4	1.90	0.73	63.3
Are there any mechanism/measurements for patients and public awareness regarding the concept and importance of triage system?	19.2	29.7	51.1	1.68	0.77	56.0
Do you conduct a periodical drill or simulation for triaging mass causality events that involves a large number of injured patients?	11.0	33.5	44.5	1.52	0.68	50.6
Is there co-worker such as stretchers worker who trained for handling and moving patients are available at the triage area?	22.0	33.5	44.5	1.77	0.78	59.0

Table 4.4 illustrates that most health care providers (73.6%) reported that in emergencies and big events, that involved a big number of causalities support, is provided with additional staff for triage area. The researcher pointed that during emergency situation, most of the hospital staff are willing to participate in handling the emergency situation. From the researcher point view supporting the ED staff with extra backup from another areas in the hospital as part of the hospital plan during emergency situations like using emergency floating team with special call cods gives more meaning for your emergency preparedness and improve the performance of your hospital response plan during crises and mass causality events.

Nearly 36% of staff reported the number of staff in ED is not enough. This study is compatible somehow with Nasir study that reflect about 26% of the ED staff recommended that more nurse's staff were needed in ED (Nasir, 2014). In addition, 36.7% of staff said that they did not receive enough training program. While the study revealed that nurses more years of experience were assigned to perform triage and this efficiently affecting performing the triage implementation in a timely manner for all patients' categories and gathering more information affecting their decision making for sure (Richardson, 2009). In addition, Considine, Botti, and Thomas, (2007) reveled that education and succession planning are an important part of facilitating and maintaining a sufficient supply of skilled triage staff in EDs (Considine, Botti, and Thomas, 2007).

Only 50.6% of providers reported that conducting a periodical drill or simulation for triaging mass causality events that involves a large number of injured patients. The researcher pointed this result to the current political and financial status since most of the hospitals considered through the daily Israeli aggression and escalation is a part of their drill. In addition, finding showed that only 56% of providers reported that there any mechanism/measurements for patients and public awareness regarding the concept and importance of triage system. Moreover, 59% of providers showed that availability of co-worker such as stretcher workers who are trained for handling and moving patients are available at the triage area.

4.2.3 Equipment and machines domain

The triage area is designed for quick assessment and simple interventions performed by the triage nurses. Therefore not that much equipment required but some equipment needed such as; mobile patient assessment and monitoring equipment, equipment and medications for simple treatment measures, a triage assessment room incorporating (nude weight) baby weighing facilities, wheelchairs and emergency trolley, communication system, electronic information entry portal either computer terminal or hand held device. Security and duress alarms also needed (Australasian College for Emergency Medicine, 2014 and Australasian Health Infrastructure Alliance, 2012).

The study revealed that the mean score percentage for equipment and machines aspect was 64.1% (see Table 4.5). This domain included nine items, and discussed the triage comfort and drug and equipment availability in triage area. Health care provider's perceptions were not high about the equipment and mechanism related issues. The researcher pointed this findings to the concept that triage process doesn't need that amount of equipment or sophisticated equipment but still there is demands for quick assessment equipment such as vital signs monitor including pulse Oximeter, ECG, NIPP, HR, RR, and temperature. In addition to some equipment like weight scale, splinting, dressing equipment and other disposables as well as portable oxygen and chargeable suction unit. Some other equipment for assessment like stethoscope, proper light sources, and emergency trolley may be needed, as well as the documentation tags with the agreed color.

Table (4.5) Distribution of responses in reference to equipment and machines related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted %
Are there enough numbers of equipment and instrument that needed to provide care for patients and injured people at the triage area?	25.8	42.3	31.9	1.93	0.75	64.3
Are there enough amounts of drugs and disposals available at the triage area to provide first aid and urgent care for patients and injured people?	25.8	41.8	32.4	1.93	0.76	64.3
Is there a system in place for periodical maintenance and follow up for these equipment, which guarantee its work and efficacy?	31.9	36.8	31.3	2.00	0.79	66.6
Do you have enough storing places for these equipment and instilments to protect it from damage and being lost?	27.5	37.4	35.2	1.92	0.78	64.0
Are there enough number of beds at the triage area in proportion to the number of patients and the injured?	19.8	36.8	43.4	1.76	0.76	58.6
Are there enough number of trolleys, stretchers, and wheel chairs for transporting, carrying, and evacuating patients and injured at triage area?	29.1	26.4	44.5	1.84	0.84	61.3
Does the equipment, which needed for transporting patients and injured in and out of the triage area available such as portable oxygen cylinders and others?	29.7	41.2	29.1	2.00	0.76	66.6
Do you have a clear mechanism for checking equipment redness and competency at the triage area?	22.5	41.2	36.3	1.86	0.75	62.0
Is there a clear mechanism in place for quick access to well-equipped ambulance vehicles for patients and injured transportation whenever needed?	23.6	46.2	30.2	1.93	0.73	64.3

Table 4.5 illustrates that 35.7% of participants reported that there is lack of equipment and instrument that needed to provide care for patients and injured people at the triage area. Finding is inconsistent with Nasir study, which revealed that only 17.3% of the participants said the equipment were insufficient (Nasir, 2014). The researcher attributed this differences in the lack of equipment could be as result of the current political situation, siege and closing borders in GS.

Fifty nine percent of participants reported in the item "Are there enough number of beds at the triage area in proportion to the number of patients and the injured?", followed by " Are there enough number of trolleys, stretchers and wheel chairs for transporting, carrying and evacuating patients and injured at triage area?" 61.3%, and item "Do you

have a clear mechanism for checking equipment redness and competency at the triage area?" 62.0%. The researcher this finding to the increasing number of patients who visit the ED and increasing demands on the services as well as the shortage in providing this equipment.

4.1.4 Registration and documentation domain

Registration and documentation are essential component of healthcare services system and particularly in emergency healthcare services. Establishing a viable data base system is of a great value helping in sitting indicators, mentoring performance, making statistics, auditing and publishing information regarding emergency healthcare services. Therefore developing a good data base system is very important for keeping patients medical records and other related forms, sheets and data manually and electronically should take place in order to get benefit from these raw data.

This part included thirteen items that illustrated the perceptions of health care providers toward registration and documentation services. The result showed that the highest mean score percentage was in registration and documentation related aspect as it reached 68.0% (Table 4.6); but it is still not adequately cover. Regardless this percentage, the researcher still notes that there is a gap in documentation and registration since there are many forms was missed such as colored tags, in addition to improper utilization of these data electronically, this reflected in lack of auditing and publication.

Finding shows that around 77.0% of health care providers reported that there a clear mechanism for dealing with dead bodies. Moreover, 72.3% of participants reported that there is a registration system for unknown cases during disasters or accidents and there are special forms to document the juridical and legal suspicious cases. Additionally,

finding showed that 69.3% of providers reported availability of documentation tools meets the demands, and 68.3% reported availability of a clear mechanism for dealing with remnants and amputated body parts. From researcher point of view, this related to recurrent exposure to emergency, which developed the staff experience and performance in dealing with such conditions.

Table (4.6) Distribution of responses in reference to registration and documentation related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted%
Does the forms, which needed for documentation and triaging data of patients and injured is available in accordance with the designed system of the ED?	33.5	33.5	33.0	2.00	0.81	66.6
Is there a clear mechanism for documenting triage process and patient registration manually "on paper forms"?	31.3	40.1	28.6	2.02	0.77	67.3
Is there a clear mechanism for documenting triage process and patient registration electronically?	32.4	37.4	30.2	2.02	0.79	67.3
Does the patient sent from the triage area to the initial assessment area of the ED, with special form?	32.4	41.2	26.4	2.06	0.76	68.6
Does the patient sent from the triage area to the initial assessment area of the ED, with medical attendance?	18.7	37.9	43.4	1.75	0.75	58.3
Are there special forms to document the juridical and legal suspicious cases.	41.2	35.2	23.6	2.17	0.78	72.3
Is there a registration system for unknown cases during disasters or accidents.	40.7	36.6	23.1	2.17	0.78	72.3
Is there a registration system for critical cases at bedside.	36.8	34.1	29.1	2.07	0.81	69.0
Is there a clear mechanism for dealing with dead bodies?	51.6	28.0	20.3	2.31	0.78	77.0
Is there a clear mechanism for dealing with remnants and amputated body parts ?	33.0	39.6	27.5	2.05	0.77	68.3
Does the available documentation tools meet the demands?	33.5	41.8	24.7	2.08	0.76	69.3
Is there good utilization of patients and injured data for sitting performance indicators, quality assurance, and the purpose of scientific research?	20.9	44.5	34.6	1.86	0.73	62.0
There are periodical publishing and auditing of the statistical performance of the hospital ED.	16.5	43.4	40.1	1.76	0.71	58.6

In contrast, the lowest score 58.3% in documentation and registration domain was reported in the item “Does the patient sent from the triage area to the initial assessment

area of the ED, with medical attendance?" The researcher attributed these results to the shortage of staff who are assigned at triage area.

4.1.5 Communication related domain

Communication considered the main back bone of the EMS system and an essential elements of that system were as in emergency situation it is a killing point and it is of great important to communicate quickly and to transfer accurate information from the field, between the providers and decision makers in the high level (WHO, 2011). This domain is clarifying the mechanism of how the team deals and communicate with other which includes 6 items. The result showed that the mean score percentage was reached 65.3%. This finding indicted that hhealthcare provider's perceptions were not high about the communication related issues. The researcher attribute this finding to different factors like no unity of command and miss coordination between all providers, lack of equipment and tools, and no pre-hospital alert with the Prehospital EMS.

Table (4.7) Distribution of responses in reference to communication related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted %
Is there a clear mechanism of communication for requesting the human and logistic support to triage area?	28.0	41.8	30.2	1.97	0.76	65.6
Is the necessary wire and wireless communication means available and sufficient at the triage area in specific and the ED in general such as "Phone line, Intercoms, Mobiles, Wireless, pager"?	15.9	40.7	43.4	1.72	0.72	57.3
Is there is a pre-hospital alert system?	30.8	33.0	36.8	1.94	0.81	64.6
Is there is a clear mechanism in place for communication between the nurses in triage area , the ED's staff and the ED's different areas as well as the other hospital departments?	26.4	42.9	30.8	1.95	0.75	65.0
Is there a pre-prepared contact list in hand with the names and numbers of ED's staff for call when needed?	39.0	39.0	22.0	2.17	0.76	72.3
Is there a clear mechanism of (communication) Line of Communication in emergency situation?	26.9	45.6	27.5	1.99	0.73	66.3

As shown in the above table, the item “Is there a pre-prepared contact list in hand with the names and numbers of ED's staff for call when needed?” reached the highest mean score as perceived by health care providers 72.3%, followed by item “Is there a clear mechanism of (communication)Line of Communication in emergency situation?” which represent 66.3%. In contrast, the lowest mean score was reported in the item “Does the necessary wire and wireless communication means available and sufficient at the triage area in specific and the ED, in general such as "Phone line, Intercoms, Mobiles, Wireless, pager?” which represent 57.3%. This finding inconsistent with WHO standard of communication that should be available at ED (WHO, 2011).

4.1.6 Standers and protocols domain

In order to work effectively and efficiently you need to sit standards and protocols to control the performance and the scope of practice. The researcher in this study and particularly in sitting the main areas of the questionnaire intentionally delay the standards and protocols even it has the main priority for this study and the reason behind that because it is shakeable one. This domain concern about availability of protocols in triage and consisted 17 items. The study revealed that the mean score percentage for this domain was 61.6%; which is the lowest one, reflecting a not high perceptions toward the standards and protocols services domain. The researcher contributed this to the fact that there are no written protocols or standards concerning triage in most hospitals and if it is present no one knows that it existing and this is a real problem.

Finding showed that around 70.0% of health care providers thought that the registered triage system at their hospital ED's were available. Finding are in line with study conducted in Jordan 2014 which revealed that only 63.6% of ED have a system for screening and providing triage for patients (Nasir, 2014).

Moreover, 68% of participants reported that the period that patient waits at the triage hall tell receiving treatment according to triage system is reasonable.

Table (4.8) Distribution of responses in reference to standers and protocols related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted %
Is there a registered Triage system at your hospital ED's?	35.7	38.5	25.8	2.09	0.78	69.6
Is there a written standard or protocol about / for the current triage system?	18.7	45.6	35.7	1.82	0.71	60.6
Does the staff receive training for applying this protocol?	26.4	42.3	31.3	1.95	0.76	65.0
Was this standard or protocol published, printed, and distributed to all ED's staff and the concerned people who apply the system?	14.3	45.1	40.7	1.73	0.69	57.6
Was this standard or protocol published, printed and distributed to the patients and attendance at the ED, explaining the mechanism of triage in accepting manner?	23.1	32.4	44.5	1.78	0.79	59.3
Is there a well-qualified and skilled nurse assigned to perform the triage process.	25.3	47.3	27.5	1.97	0.72	65.6
According to triage, system Does the period that patient wait in the triage hall until he or she received treatment reasonable?	30.8	42.9	26.4	2.04	0.75	68.0
Is there a hospital emergency plan that clarifies the triage process during Mass - Causality Incidence?	24.7	36.8	38.5	1.86	0.78	62.0
Does the ED's staff aware and participate in setting the hospital emergency plan.	21.4	43.4	35.2	1.86	0.74	62.0
Is there a clear mechanism or protocol for activating hospital emergency plan?	18.7	47.3	34.1	1.84	0.71	61.3
Is there a clear standard or protocol for training the technical and administrative staff on how to perform triage process?	14.8	42.9	42.3	1.72	0.70	57.3
Did you perform community/public a weariness program regarding the concept and importance of triage system?	11.5	49.6	39.0	1.72	0.65	57.3
Are there available standards and protocols regarding transporting and referring patients inside and outside the hospital?	24.7	42.3	33.0	1.91	0.75	63.6
Are there a clear protocols regarding admitting and discharging patients?	20.9	46.2	33.0	1.87	0.72	62.3
Is there a periodical reviewing for standards and protocols related to triage system, as well as the other standards and protocols as needed?	15.9	37.4	46.7	1.69	0.73	56.3
Are there general indicators to Measure the Ed's performance in general and triage area in particular?	15.9	40.1	44.0	1.71	0.72	57.0
Do you take advantage and withdraw lessons from the evaluation process after each events?	20.9	40.1	39.0	1.81	0.75	60.3

Nearly 66% of providers agree that the nurse available in triage area is well qualified and assigned to perform the triage process, and 65% of providers have received training for applying protocol. About 63.6% of participants said that the available standards and protocols regarding transporting and referring patients inside and outside the hospital. Regarding availability of a clear protocols regarding admitting and discharging patients, only 62.3% of participants reported available of clear protocol.

Nearly 43% of participants reported that there is no community/public Awareness program done regarding the concept and importance of triage system. Lack of awareness for patients and their attendance as well as the community regarding the importance of triage and its concepts affect adversely on the performance of the ED staff and thus the quality of care provided. This finding and interpretation are compatible with Ontario Hospital Association report (2010).

The lowest mean score in this domain was observed in the item "Available of a periodical reviewing for standards and protocols related to triage system, as well as the other standards and protocols as needed" which represent 56.3%, followed by item "Available a general indicators to measure the EDs performance in general and triage area in particular" which represent 57.0%.

4.3 Inferential Analysis

To explore differences in perceptions about the triage system in reference to demographic and occupational variables of nurses and physicians, the researcher conducted inferential analysis as illustrated below.

4.3.1 Differences in perceptions about triage system according to gender

Table 4.9 illustrates differences in perceptions of the overall perceptions in reference to gender. T-test results show that there were no statistical significant differences between all study domains according to gender (*P*= 0.085), despite the fact that female had slightly higher scores. However, in standards and protocols domain, females had higher mean percentage than males and the variations between the two groups were statistically significant (*P*= 0.032).

Table (4.9) Differences in perceptions about triage system according to gender

Triage system domains	Gender	N	Mean	Std. Deviation	t	Sig.
Structure and design	Male	167	1.859	0.514	1.116	0.266
	Female	15	2.015	0.582		
Human resources	Male	167	1.860	0.491	0.941	0.348
	Female	15	1.985	0.498		
Equipment and machines	Male	167	1.898	0.618	1.895	0.060
	Female	15	2.214	0.622		
Registration and documentation	Male	167	2.027	0.562	1.182	0.239
	Female	15	2.205	0.506		
Communication	Male	167	1.942	0.591	1.479	0.141
	Female	15	2.177	0.585		
Standards and protocols	Male	167	1.824	0.559	2.195	**0.032***
	Female	15	2.152	0.622		
Overall %	**Male**	**167**	**1.893**	**0.476**	**0.1.733**	**0.085**
	Female	**15**	**2.118**	**0.531**		

The researcher attributed the difference in perception of standards and protocols for the favor of female may be because female is more committed to triage protocols and they are mainly work in morning shift. In addition, it could be related to the small sample size of females.

4.3.2 Differences in perceptions about triage system according to age

Table 4.10 illustrates differences in perceptions of triage system in reference to age. T-test results showed that there were no statistically significant differences between overall perception scores according to age (p=0.7892), despite the fact that health care providers more than 40 years reported higher perceptions scores in all study domains compared with other group.

Table (4.10) Differences in perceptions about triage system according to age

Triage system domains	Age	N	Mean	Std. Deviation	F	Sig.
Structure and design	20-30 years	92	1.885	0.556	0.829	0.438
	31-40 years	53	1.801	0.459		
	More 40 years	37	1.939	0.513		
Human resources	20-30 years	92	1.863	0.527	0.177	0.838
	31-40 years	53	1.853	0.426		
	More 40 years	37	1.912	0.499		
Equipment and machines	20-30 years	92	1.915	0.642	0.804	0.449
	31-40 years	53	1.865	0.523		
	More 40 years	37	2.033	0.703		
Registration and documentation	20-30 years	92	2.041	0.543	0.004	0.996
	31-40 years	53	2.046	0.620		
	More 40 years	37	2.035	0.516		
Communication	20-30 years	92	1.969	0.608	0.286	0.751
	31-40 years	53	1.915	0.589		
	More 40 years	37	2.009	0.570		
Standards and protocols	20-30 years	92	1.874	0.607	0.148	0.862
	31-40 years	53	1.824	0.541		
	More 40 years	37	1.833	0.527		
Overall %	**20-30 years**	**92**	**1.919**	**0.520**	**0.246**	**0.782**
	31-40 years	**53**	**1.876**	**0.438**		
	More 40 years	**37**	**1.945**	**0.458**		

4.3.3 Differences in perceptions about triage system according to occupation

Table 4.11 illustrates the differences in the overall perceptions of triage system according to occupation by using independent samples t-test. Finding showed that, nurses reported higher perceptions scores in all study domains than doctors. The variations between the two groups were highly statistically significant (P= 0.004).

Table (4.11) Differences in perceptions about triage system according to occupation

Triage system domains	Occupation	N	Mean	Std. Deviation	t	Sig.
Structure and design	Doctor	97	1.799	0.495	2.030	**0.044***
	Nurse	85	1.955	0.539		
Human resources	Doctor	97	1.781	0.462	2.660	**0.009***
	Nurse	85	1.972	0.507		
Equipment and machines	Doctor	97	1.819	0.574	2.484	**0.014***
	Nurse	85	2.045	0.656		
Registration and documentation	Doctor	97	1.957	0.490	2.206	**0.029***
	Nurse	85	2.138	0.616		
Communication	Doctor	97	1.848	0.559	2.790	**0.006***
	Nurse	85	2.090	0.607		
Standards and protocols	Doctor	97	1.733	0.556	3.037	**0.003***
	Nurse	85	1.985	0.559		
Overall %	**Doctor**	**97**	**1.816**	**0.446**	**2.900**	**0.004***
	Nurse	**85**	**2.021**	**0.503**		

The researcher attributed significant level to nurses because they are fixed teams and know the demographic structure of the ED better than doctors know. Furthermore, the nurse's nature of work is a holistic approach and focus on each dimensions of patient care while doctors focus on medical aspect of patients care.

4.3.4 Differences in perceptions about triage system according to the work place

Table (4.12) Differences in perceptions about triage system according to the work place

Triage system domains	Work place	N	Mean	Std. Deviation	F	Sig.
Structure and design	Shifa	99	1.746	0.522	16.852	**0.000***
	Al-Quds	18	2.009	0.432		
	EGH	52	1.856	0.393		
	Awda	13	2.701	0.188		
Human resources	Shifa	99	1.835	0.457	20.176	**0.000***
	Al-Quds	18	1.895	0.230		
	EGH	52	1.713	0.460		
	Awda	13	2.735	0.215		
Equipment and machines	Shifa	99	1.824	0.579	20.217	**0.000***
	Al-Quds	18	2.413	0.411		
	EGH	52	2.413	0.566		
	Awda	13	2.820	0.124		
Registration and documentation	Shifa	99	1.911	0.501	15.169	**0.000***
	Al-Quds	18	2.311	0.227		
	EGH	52	1.995	0.455		
	Awda	13	2.846	0.864		
Communication	Shifa	99	1.838	0.566	12.927	**0.000***
	Al-Quds	18	2.342	0.276		
	EGH	52	1.881	0.564		
	Awda	13	2.692	0.526		
Standards and protocols	Shifa	99	1.779	0.522	20.689	**0.000***
	Al-Quds	18	1.983	0.205		
	EGH	52	1.745	0.584		
	Awda	13	2.642	0.546		
Overall %	Shifa	99	**1.813**	**0.458**	**20.689**	**0.000***
	Al-Quds	18	**2.123**	**0.233**		
	EGH	52	**1.822**	**0.409**		
	Awda	13	**2.732**	**0.328**		

* Statistically significant

Table 4.12 illustrates differences in perceptions according to work place. One-way ANOVA test results show that there were statistical significant differences in all study domains according to the work place, as shown in the table 4.12. Despite the fact that means percentage scores of perceptions were higher in Awda hospital followed by Al-Quds hospital.

Regarding structure and design, human resources, and communication domains , post hoc comparisons using the Scheffee test revealed that there are significantly differences between work place and both domains, this significant is favor for providers working at Awda hospitals in comparison with Al-Shifa hospital.

For equipment and machines domain, post hoc comparisons using the Scheffee test revealed that there are significantly differences between work place and structure and design domain, this significant is favor for providers working at Al-Quds and Awda hospitals in comparison with Al-Shifa hospital (P value= 0.001; P value= 0.000) respectively.

Concerning registration and documentation domain, post hoc comparisons using the Scheffee test revealed that there are significantly differences between work place and registration and documentation domain, this significant is favor for providers working at Al-Quds and Awda hospitals in comparison with Al-Shifa hospital (P value= 0.024; P value= 0.000) respectively. In addition, significant difference was observed between EGH and Awda hospital, this difference was favor for Awda hospital. Generally, Scheffee test revealed that total score of triage system was significantly higher among providers at Al-Quds and Awda hospitals in comparison with EGH and Al-Shifa hospitals.

Although the respondents results concerning structure and design for the favor of the private sector hospitals ED, but from the researcher point view, observation, and reviewing the flow chart of each hospital still there is some critical problem represented in patient flow and main hospital entrance (Annex, 8)

4.3.5 Differences in perceptions about triage system according to educational level

Table (4.13) Differences in perceptions about triage system according to educational level

Triage system domains	Work place	N	Mean	Std. Deviation	F	Sig.
Structure and design	Diploma	35	1.9983	0.547	1.765	0.156
	Bachelor	113	1.880	0.532		
	Master	23	1.703	0.389		
	PhD	11	1.738	0.496		
Human resources	Diploma	35	1.961	0.532	1.423	0.238
	Bachelor	113	1.885	0.494		
	Master	23	1.748	0.374		
	PhD	11	1.686	0.527		
Equipment and machines	Diploma	35	2.098	0.661	3.123	**0.027***
	Bachelor	113	1.947	0.636		
	Master	23	1.618	0.419		
	PhD	11	1.777	0.511		
Registration and documentation	Diploma	35	2.107	0.567	0.771	0.512
	Bachelor	113	2.055	0.586		
	Master	23	1.966	0.446		
	PhD	11	1.846	0.453		
Communication	Diploma	35	2.071	0.609	1.789	0.151
	Bachelor	113	1.985	0.596		
	Master	23	1.811	0.562		
	PhD	11	1.681	0.485		
Standers and protocols	Diploma	35	1.976	0.597	1.565	0.199
	Bachelor	113	1.862	0.572		
	Master	23	1.698	0.470		
	PhD	11	1.657	0.607		
Overall %	Diploma	35	**2.027**	**0.530**	**2.052**	**0.108**
	Bachelor	113	**1.926**	**0.489**		
	Master	23	**1.754**	**0.330**		
	PhD	11	**1.732**	**0.453**		

Table 4.13 illustrates differences in perceptions according to educational level. One-way ANOVA test results show that there were no statistical significant differences in all study domains according to educational level (*P*= 0.108), despite the fact that health care providers have diploma degree had higher scores when comparing with other degree. The significant difference was only shown in equipment and machines domain (*P*= 0.027), and the difference favor for diploma degree.

Post hoc comparisons using the Scheffee test informed that there are significantly differences between health care providers have diploma degree in comparison providers have master degree. This means that the perception of equipment and machines domain is in favor of low educated providers. The researcher attributed this significant in

equipment and machines to staff with diploma degree, which could be, related to the nature of work and job description this group.

4.3.6 Differences in perceptions about triage system according to the years of experience in ED

Table 4.14 illustrates the differences in the overall perceptions of triage system according to years of experience in ED by using independent samples t-test. Finding showed that, health care providers whose experience in ED less than 5 years had better scores than health care providers whose experience in ED more than 5 years on all study domains. The differences between the means of all triage system domains due to years of experience in ED have not reached statistically significant level ($p>0.05$) (table 4.14).

Table (4.14) Differences in perceptions about triage system according to the years of experience in ED

Triage system domains	Years Exp. ED	N	Mean	Std. Deviation	t	Sig.
Structure and design	≤ 5 years	107	1.914	0.531	1.309	**0.192**
	> 5 years	75	1.811	0.502		
Human resources	≤ 5 years	107	1.896	0.514	0.837	**0.404**
	> 5 years	75	1.834	0.549		
Equipment and machines	≤ 5 years	107	1.934	0.623	0.250	**0.803**
	> 5 years	75	1.911	0.626		
Registration and documentation	≤ 5 years	107	2.054	0.597	0.368	**0.713**
	> 5 years	75	2.023	0.502		
Communication	≤ 5 years	107	1.933	0.599	0.774	**0.440**
	> 5 years	75	2.002	0.586		
Standers and protocols	≤ 5 years	107	1.898	0.611	1.330	**0.185**
	> 5 years	75	1.784	0.502		
Overall %	**≤ 5 years**	**107**	**1.938**	**0.507**	**0.858**	**0.392**
	> 5 years	**75**	**1.875**	**0.448**		

4.3.7 Differences in perceptions about triage system according to the years of experience in the hospital

Table 4.15 illustrates the differences in the overall perceptions of triage system according to years of experience in the hospital by using independent samples t-test. Finding showed that, health care providers whose experience in hospital less than 10 years had better scores than health care providers whose experience in hospital more than 10 years on all study domains. The differences between the means of all triage

system domains due to years of experience in hospital have not reached statistically significant level (p>0.05) (table 4.15).

Table (4.15). Differences in perceptions about triage system according to the years of experience in ED in the hospital

Triage system domains	Years Exp.	N	Mean	Std. Deviation	t	Sig.
Structure and design	< 10 years	129	1.894	0.513	0.915	0.361
	≥ 10 years	53	1.816	0.538		
Human resources	< 10 years	129	1.869	0.497	0.064	0.949
	≥ 10 years	53	1.874	0.483		
Equipment and machines	< 10 years	129	1.913	0.614	0.401	0.689
	≥ 10 years	53	1.953	0.648		
Registration and documentation	< 10 years	129	2.057	0.567	0.601	0.548
	≥ 10 years	53	2.002	0.542		
Communication	< 10 years	129	1.959	0.598	0.056	0.955
	≥ 10 years	53	1.965	0.585		
Standards and protocols	< 10 years	129	1.873	0.571	0.808	0.420
	≥ 10 years	53	1.798	0.569		
Overall %	**< 10 years**	**129**	**1.924**	**0.489**	**0.511**	**0.610**
	≥ 10 years	**53**	**1.883**	**0.471**		

4.4 Perceptions of administrators in regard to triage system

In this part, the researcher also assigned scores to the responses of administrator staffs with giving higher score to relevant conditions/responses and lower scores to things that are not relevant. After grouping the questions for each aspect and computing them (the scores), a mean percentage is revealed with higher mean percentages indicating relevant conditions and vice versa. This domain is concern about administration staffs and clarifies the mechanism of how the team deals and communicate with other and coverage of staff and numbers which includes 9 items. The result showed that the mean score percentage was reached 78.2%%. This finding indicted that administration staffsreflecting a good perspectives and relevant.

Table (4.16) Distribution of responses of administrators in reference to triage system related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted%
Is there a place assigned for administrative personnel at or near by the ED's area?	58.3	25.0	16.7	2.416	0.769	80.5
Are there enough number of administrative to personnel cover the work at the hospital ED, 24hr./7 days a week?	58.3	33.3	8.3	2.500	0.654	83.3
Is there a direct communication means between the ED's staff and the administrative personnel for quick call in case support needed?	52.8	38.9	8.3	2.444	0.652	81.4
Do the administrative personnel have a plan to manage the crisis at the ED, as well as the hospital?	44.4	44.4	11.1	2.333	0.676	77.7
Are they involved in sitting the emergency plan for the hospital in general and ED's in particular?	38.9	36.1	25.0	2.138	0.798	71.2
Do they have training, drill, or simulation on emergency situation that involved large number of causalities rushing to ED?	33.3	38.9	27.8	2.055	0.790	68.5
Do the current administrative services provide enough level of management and cooperation with the ED's staff, patients, and attendance?	38.9	47.2	13.9	2.250	0.691	75.0
Does the current administrative plane provide the suitable support or backup whenever needed by staff in a timely manner?	38.9	58.3	13.9	2.250	0.542	75.0
Did you participate in pervious situation in ED	72.2	19.4	8.3	2.638	0.639	87.9
Overall mean score				2.348	0.321	78.2

The above table shows, around 90.0% of staff participated in pervious situation in ED. Moreover, 83.3% of staff reported that there enough number of administrative to personnel cover the work at the hospital ED, 24hr. /7 days a week. About 81.4% of staff reported that there a direct communication means between the ED's staff and the administrative personnel for quick call in case support needed.

The lowest percentage mean was observed in the item “Does the current administrative plane provide the suitable support or backup when ever needed by staff in a timely manner?” and item “Does the current administrative services provide enough level of management and cooperation with the ED's staff, patients and attendance?” which represent 75.0%

Table (4.17). Differences in perceptions of administrators about triage system according to selected demographic and occupational variables

Variables	Categories	N	Mean	Std. Deviation	Test	Sig.
Gender	Male	27	2.337	0.328	t= 0.362	0.720
	Female	9	2.382	0.314		
Age	20-30 years	11	2.535	0.209	F= 3.029	0.062
	31-40 years	10	2.288	0.389		
	More 41 years	15	2.251	0.298		
Work place	Shifa	14	2.119	0.240	F= 9.323	**0.000***
	Al-Quds	5	2.644	0.182		
	EGH	12	2.361	0.288		
	Al-Awda	5	2.666	0.175		
Years exp. hospital	< 10 years	16	2.354	0.320	t= 0.089	0.930
	≥ 10 years	20	2.344	0.330		
Years exp. ED	≤ 5 years	25	2.360	0.325	t= 0.312	0.757
	> 5 years	11	2.323	0.323		

The above table shows the different perceptions of administrators about triage system. Finding showed that there were no statistical significant differences between males and females about administration items (*P*= 0.720), despite the fact that female had slightly higher scores. Moreover, in variable years of experience and years of experience in the ED, finding shows that there were no statistical significant differences between group

(*P*= 0.930; 0.757) respectively. The significant difference (*P*= 0.000) was observed in work place variables, and the difference was favor for Al-Awad hospital followed by Al-Quds and EGH.

4.5 Perceptions of triage system related items (Security perspectives)

In this part, the researcher also assigned scores to the responses of security staffs with giving higher score to relevant conditions/responses and lower scores to things that are not relevant. This domain is concern about security staffs and clarifies the mechanism of how the team deals and communicate with other and coverage of staff and numbers which includes 10 items. The result showed that the mean score percentage was reached 71.0%. This finding indicted that security staffsreflecting a good perspectives and relevant.

Table (4.18) Distribution of responses of security staff in reference to triage system related item

Items	Relevant	Somewhat relevant	No relevant	Mean	S.D	Weighted%
Is there a place assigned for security personnel at or near by the triage area?	44.1	20.6	35.3	2.088	0.900	69.6
Is there enough number of security/police to personnel cover the work at the hospital ED, 24hr. /7 days a week?	26.5	23.5	50.0	1.764	0.854	58.8
Is there a direct communication means between the ED's staff and the security/police personnel for quick call in case of violence eruption has been occurs?	44.1	38.2	17.6	2.264	0.751	75.4
Does the security/police personnel have a plan to control the entrance, exit, corridors and the elevators at the ED, as well as the hospital?	47.1	23.5	29.4	2.176	0.869	72.5
Does security staff control of number of visitors in ED when ED is crowded	20.6	47.1	32.4	1.882	0.728	62.7
Are they involved in sitting the emergency plan for the hospital in general and ED's in particular?	44.1	26.5	29.4	2.147	0.857	71.5
Do they have training, drill, or simulation on emergency situation that involved large number of causalities rushing to ED?	17.6	47.1	35.3	1.823	0.716	60.7
Do the current security/police services provide enough level of protection to the ED's staff, patients and attendance?	23.5	58.8	17.6	2.058	0.684	68.6
Does the current security/police plane provide the suitable support or backup whenever needed by staff in a timely manner?	38.2	52.9	8.8	2.294	0.629	76.4
Did you participate in pervious situation in ED	82.4	17.6	0.0	2.823	0.386	94.1
Overall mean score				2.132	0.417	71.0

The above table shows, about 94.1% of staff participated in pervious situation in ED. Moreover, 67.4% of staff reported that the current security/police plane provide the suitable support or backup when ever needed by staff in a timely manner. In addition, 41.2% of staff reported the insufficient number of security/police to personnel cover the work at the hospital ED. Lack of security staff affects adversely on the staff performance exposing them to the risk of violence (Nachreiner et al., 2005).

Table (4.19) Differences in perceptions of security staff about triage system according to selected demographic and occupational variables

Variables	Categories	N	Mean	Std. Deviation	Test	Sig.
Gender	Male	33	2.136	0.423	t= 0.317	0.753
	Female	1	2.000	0.000		
Age	20-30 years	2	1.500	0.000	F= 2.686	0.084
	31-40 years	16	2.168	0.373		
	More 41 years	16	2.175	0.432		
Work place	Shifa	13	1.923	0.130	F= 32.527	**0.000***
	Al-Quds	4	2.450	0.264		
	EGH	8	1.750	0.192		
	Al-Awda	9	2.633	0.291		
Years exp. hospital	< 10 years	27	2.011	0.354	t= 4.015	**0.000***
	≥ 10 years	7	2.600	0.305		
Years exp. ED	≤ 5 years	24	2.070	0.329	t=1.347	0.178

The above table shows the different perceptions of security staff about triage system. Finding showed that there were no statistical significant differences between males and females concerning security items (*P*= 0.753), despite the fact that male had slightly higher scores. Additionally no significant different observed in age and years of experience in ED variables. Statistically significant differences observed in the work place variables, and the difference was favor for Al-Awad hospital followed by Al-Quds and Al-Shifa hospital. Moreover, statistically significant difference was observed in experience in the hospital variable, and the difference was favor for staff working in hospital more than 10 years (*P*= 0.000).

4.6 Qualitative Part

Key informative Results

The researcher conducted a Key informant interviews with all hospital directors and head doctor and nurse of ED in the four targeted hospitals (n= 12). Key informant interviews questions concentrated on four major themes:

a. Implementation of triage system.

b. Equipments and resources

c. Documentation and registration

d. Limitation and recommendation

The first theme asked the interviewers to talk about real aim behind applying the triage idea at your hospital, and who is sponsored for applying it, and information about the budget, which assigned for applying that system at your hospital. Furthermore, asked the interviewers about type of triage system that has been applied in Gaza hospital, and conducting any preparatory workshops on the application of the current triage system and they credited any protocol or a specific standard.

Al Al-Shifa hospital:

The General Director at Al-Shifa hospital and head of doctors and nurses of ED agrees that there "*it is a scientific international system that should be applied specially for a hospital like shifa which receiving a huge number of cases up to 800 cases daily. And should be applied not only to ED but to the operation room and the X-ray department*". *The system was applies science at least 8 years and sponsored by the ICRC and MOH, and no specific budget assigned for that*. The director also said, "They *used the military triage system with the four color tags*", *and the ICRC and MOH candidates did the training for doctors and nurses as perpetration for implementing the system during the reconstruction period of the ED.* Furthermore, he said, "they *is no written protocol*

regarding the triage system but the stuff get training through workshop and lectures that already done. Also the director *said "the current structure has a limited capacity and difficult to modified and in Mass Causalities during war time we try to increase the capacity through providing alternative solution and compatible with emergency plan.* In contrast the head nurse disagree with general director regarding the availability of written triage protocol they said that *"there is a written procedures and policies for the different measures that taken by the ED staff including triage and dealing with prisoners as an example".*

European Gaza Hospital (EGH)

The General Director at (GEH) and head of doctors and nurses of ED agrees that, *"the current the current triage system is important to organize the overcrowded and sorting the cases according to the system priorities and controlling the cold cases as well as the patient flow within the emergency department, especially in mass causalities and during crises time*" *he said also "the system implemented two years ago and sponsored by ICRC " moreover he said "there is no benchmarking for any specific international triage system but the ICRC, applied the four tags military triage system which considered an international one*" *he also said "that there is no single triage international triage system can fitted our situation here in GS, simply because we have a unique situation and strong cultural barriers that represent a strong challenges for applying the system*" *he persist and said "that there is written version of that triage protocol and they have a periodical training on applying that protocol for all staff members including the security staff who plays an important role in applying the system*" *farther more he said that "we don't have a fixed medical emergency team and this dilemma represent a big obstacle in applying the system as well as the quality of emergency healthcare services provided*".

At the other hand the head nurse disagree with general director and the head of ED doctors regarding the availability of written triage protocol he said that *"there is no written protocol for the current triage system and they have no idea about it"*.

Al-Quds Hospital (PRCS)

The General Director at Al-Quds Hospital (PRCS) and head of doctors and nurses of ED agrees that *"the triage is an international system applied in order to save lives, organize patient flow during crises and mass causality and utilize wisely the available scarce resources" he proceed saying that "we have applied the triage as a knowledge in 2001-2002, at the pre-hospital sittings and it is integrated in their college training programs, regarding the hospital sitting we face many difficulties related to the variation in knowledge between the medical team the doctors, nurse, and EMTs, therefore in 2006, we conducting a preparatory courses before applying the system these courses includes BTLS, ITLS, ATLS, ACLS these courses facilitate applying the triage knowledge later on*". Furthermore he said that *"there is no specific triage system has been benchmarked abut it was a mixed between the American and the Canadian triage style we modified it to mach and fit our case and in 2007-2008 we start to implement the system in the hospital sitting". Also he said that "there is review for the system should take place but the current war situation preventing this". In addition he said "no unified triage system is applied among all providers which represent a big obstacles, and there is no unity of command and every one developed his own system and for us in the PRCS, we still used the European Union Guidelines and as prehospital protocol yes we have it and it is available with Dr. Bashar Mourad".*

Al-Awda Hospital

The General Director at Al-Awda Hospital and head of doctors and nurses of ED agrees that *"the triage is of important value during emergency events where there is a lot of cases rushing to hospital ED disturbing and overwhelming the norms of its work therefore the triage system is needed to organize the process and prioritizing patient according to their urgency condition this well enhance the performance of the ED crew and save lives and preserve life of injured people". He also said "there is no triage system applied at our hospital but we use the concept of the triage and case sorting based on our experience which formed through time and as end result of recurrent exposure to war events". In addition he said "we developed in our hospital ED emergency team formed of senior surgeon doctor, Anesthesiologist and nurses they are working together as one team in harmony and developed good coordination process developed well by time and they are a fixed team and sometimes supported by specialist from the MOH, since we have shortage in some specialties such as Neurosurgery and vascular surgery". He also said that "we start working by this mechanism earlier after the invasion of Jabalia camp in 2004 and we formed a well trained team who conducting internal and external training programs done with local and external expertise". Furthermore he said "we conducting review process for our measurements before and after each events and sometimes during the events to overcome some defects or modified procedures for the work intrest".*

The second theme concerned about available of equipment and instrument and disposables that necessary for the application of the current triage system, and adequate number of qualified , trained and appropriate technical, administrative and security staff. In addition to necessary, sufficient and suitable communication mechanisms.

The General Director at Al-Shifa hospital and head of doctors and nurses of ED agrees that *"the triage process don't need a complicated equipment or tools and its simply can be provided", also said " training for all staff members is important and regarding the number of the security staff it is not enough especially during events and regarding nurses I admitted that they are efficient and fully cooperative in applying the system as much as they can and regarding doctors they are not assigned in the triage area until now but we rely on the efficiency of nurses on triage judgment with some doctors interventions sometimes at time of consultation". Moreover he said " public awareness occurs and some meetings done through the media through local TV, and radio regarding this issue and it needs follow-up". Regarding the availability of communication tools, the director said " In fact communication done personally through the telephone at the emergency department contact the other departments directly. In the past period there was a warless hand set communication tools and still existing but not enough and not effective".* The head nurse of the ED disagree with him regarding the availability of beds he asserted that " *there is beg shortage in beds numbers in the hospital especially in general surgery departments and they most of the time used the ED beds to overcome this shortage causing a real problem that not ended". He said also" there is special phone line at our ED for prehospital alert newly assigned but not activated well".*

European Gaza Hospital (EGH)

The General Director at (EGH) and head of doctors and nurses of ED agrees that "*there is big shortage in equipment in the ED in general and at the triage area in specific and only one bed in the triage area is fairly prepared with the equipment such as monitor pulse oximeter and other essential equipment and the others beds lacks of these equipment which represent problem in assessing and managing the patients*

triage". Regarding the availability of communication tools, the director said " *In fact communication done personally through the telephone at the emergency department contact the other departments directly. In the past period there was a warless hand set communication tools and still existing but not enough and not effective*". Also he said " *that there was intercom and pagers in the past designated by European managers of the hospital project as a part of its communication system but now it is not existing anymore* and we used our personal mobiles which is costly and inefficient".

Al-Quds Hospital

The General Director at Al-Quds Hospital and head of doctors and nurses of ED agrees that "the Ed is well equipped with all needed equipment such as monitors pulse oximeter, ECG machines, portable oxygen and ventilators". Also he said that "in case there is need for extra equipment the administration of the hospital provided it in a timely manner". In concern of communication tools He said "we have our own VHF wireless communication system which linked our prehospital EMS with our PRCS hospitals and it is effective one, in the past few years ago this system was linked to the MOH hospitals EDs allover GS but it is not existing anymore and the equipment were missing ". the He said also "we are reforming and updating the current communication system to improve the system integrating computer and GPS AND GIS, through our IT department in the PRCS ". finally he said "the main problem here is not equipment and capabilities but the main problem in the emergency healthcare system basically and Simply there is no Unity of Command and absence of the system".

Al-Awda Hospital

The General Director at Al-Awda Hospital and head of doctors and nurses of ED agrees that *"the ED is supplemented with enough brand-new equipment which sound faire enough in addition to the ambulance vehicles which also well prepared". He said also*

"all ancillary services such as X-ray and ultrasound are available and easily accessible at the ED". Moreover He proceeded "during events any further equipment needed for the ED they immediately provide it upon request".

The third theme handle about document and archive patients information and written emergency plan.

The General Director at Al-Shifa hospital and head of doctors and nurses of ED agrees that "*there are documentation and registration by using the colored papers filled by the nurse in addition to the patient file which is provided electronically through computer consist of two copies filled by doctors and nurses". Also he said that there is a written emergency plan but no drill or simulation was conducted and the staff become more aware developed their skills and experience through the exposure to recurrent war events. There was intention for conducting a drill but the wars was standing a barrier for doing it"* moreover he said that we are working in developed the documentation system through improving both the forms used and the computer software, but for meantime it is quite bit not enough*"*

The head of ED nurses disagree with him regarding "the availability of triage colored papers and forms that used in the hospital in general and at the ED in specific this related to shortage from the MOH*"* .

European Gaza Hospital (EGH)

The General Director at (EGH) and head of doctors and nurses of ED agrees that *"there is a good documentary and registry system available at EGH, and all information and data available at any time" . He also said that "these data utilized from the researchers and medical students routinely". "This documentation need to be unified at all MOH hospital and on one registry and domain system by another word standardized the system will be of great value for the users". Regarding triage tags and*

color or triage forms used he said "There is now documentation in this regards and only these cards attached to the patient file only"

Al-Quds Hospital

The General Director at Al-Quds Hospital and head of doctors and nurses of ED agrees that "there is documentation and registration process done and all patient records and papers were documented and the final statistical report supplemented to the MOH regularly on daily bases" furthermore he said "there is no specific triage forms being used at our ED and it should be unified by MOH and then applied to all hospitals and this is didn't happened".

Al-Awda Hospital

The General Director at Al-Awda Hospital and head of doctors and nurses of ED agrees that *"there is documentation and registration process done and every patient has a records were it is registered and documented then it sent to the medical secretary were it is kept there and the final statistical report supplemented to the MOH regularly" furthermore he said "there is no specific triage forms being used at our ED and we trained number of our administrative team for data entry and using of statistical programs to improve their performance".*

The fourth theme talks about main limitation, challenges and the recommendation for

The General Director at Al-Shifa hospital and head of doctors and nurses of ED recommended that "there *is lack of staff in general and specially the security and administrative staff and I recommended staffing ED properly as recommended". Also said that "there is limited space capacity related to the old standing structure and recommended to increase the function capacity of the ED". Moreover he recommended for increasing public awareness and cooperation of the community, provide continuous education and training for all staff members, fixed emergency teams and providing the*

suitable incentives for those how works in the EDs, provide the suitable communication tools, and patient flow and distribution of services to be in one way direction".

European Gaza Hospital (EGH)

The General Director at (EGH) and head of doctors and nurses of ED aid that "there *is lack of community understanding of the triage system". In addition, they recommended* "to *performed public awareness using the media and focus on universities an schools as well as the local community institutions". In addition, they said,* "*there is lack of equipment and tools". In addition, recommended,* "*The MOH have to provide the suitable and reasonable equipment for the ED in general and triage area in specific". They aid also* "there *is no fixed emergency team and this represent a big problem and affecting adversely the quality of care". Moreover, they recommended* "*to provide a fix emergency team through providing the suitable professional staff and providing them the needed incentives and give them promotion and better training opportunity to retain them in the ED". They also relay on* "GPs *and newly graduated doctors and staff to cover the work at the ED". They recommended* "these *GPs doctors shouldn't left to cover the work alone and need to support by a reasonable number of senior staff in each shifts". They also recommended that* "*they should have advanced training courses as accredited study hours or through university training programs not only having a certificate". Furthermore they recommended to providing the ED with a suitable number of security staff as needed".*

Al-Quds Hospital

The General Director at Al-Quds Hospital and head of doctors and nurses of ED reviled that "there is lack of coordination with other providers like MOH". They recommended to "enhancing better communication and coordination channels". They said also, "there is no unified documentation system regarding triage forms and

colors". And they recommended that "the MOH have to unify forms and documents for all providers". They also underpins that "there is no unity of command to lead the emergency situation therefore the recommended for unity of command". They said also, there is "no integrity between the prehospital EMS and the hospital emergency services". Therefore, they recommended, "having a universal approach for providing the EMS services in all sectors including both prehospital and hospital emergency services".

Al-Awda Hospital

The General Director at Al-Awda Hospital and head of doctors and nurses of ED say that "there is lack of coordination with the other healthcare providers specially MOH". They recommended to"having better coordination mechanism based on partnership". The said also "there is lack of coordination and sharing training opportunity for the staff regarding triage and other emergency courses". So they recommended that "the MOH have to share the private sector hospitals with its training programs based no partnership and supportive vision". They also said that "there is absence of system and unity of command so the recommended to have a unified system and enhance unity of command".

International Committee of the Red Cross (ICRC) ICRC Health Delegation (Vivi Heelsberg Pedersen)

To complete the research data and to give it more value we contact the ICRC health delegate "Vivi Heelsberg Pedersen" who assigned for the mission of trained our hospital EDs, staff for applying the triage system in our hospitals, she did an excellent effort in this direction and she said that "In the ICRC we are using the Triage categories described in the book: (War Surgery-working with limited resources in armed conflict), C. Giannou, M.Baldan, ICRC 2009"

She said also "*the Main Goals for applying the system is to; Improve treatment of and care for the patients and Safe working environment for the hospital staff*".

She said also "*In 2012,the ICRC trained all staff members (medical, administration, guards etc.) on the 5 key points, these 5 key points include; Crowd control, One way system, Triage system , Standardized documentation and Public awareness".*

Chapter (5) Conclusion and recommendations

This chapter provides the main conclusion and also the recommendations for the key persons and decision makers in MOH to focus on triage system service.

5.1 Conclusion

One of the most important goals of any healthcare system in the world is to provide high-quality sustainable healthcare services that respond to the needs and expectations of service users. Since the ED is the main gate for secondary and tertiary healthcare services and because emergency events can happened anywhere anytime overwhelming and disturbing the norms of emergency healthcare services of any hospital, therefore, having a well structured and organized triage system is an important element for improving emergency healthcare services outcomes and saves lives through facilitate and organize patient flow, enhance equity, wisely utilization of scares resources, and finally reducing overcrowded.

This study conducted to evaluate the triage system in GS, establish baseline data, and addressing the gaps between practice and theory in order to promote the provision of adequate services meeting user's needs and expectations and to improve the quality of triage system. The study explored the main domains of triage system service; also, it explored the differences in perceptions about triage system in reference to demographics and occupational variables.

The study sample of health care providers' demographics showed that seventy percent of the total samples were males. The prominent age group in the sample was employees whose age between 23-30 years old. Eighty percent of study populations are married. Employees who have a bachelor degree are most prominent in the sample.

Finding showed that the healthcare providers (physician and nurses) overall perception mean percentage was 63.7%. The overall mean percentage for all triage system domains scores ranged from 62.3% to 68.0%. The highest mean score was for registration and documentation domain while the lowest level was for the standards and protocols domain. While overall perception from the administrator point view was reached 78.2%. Reflecting a good perspectives and security point view was 71.0%.

The study also revealed that triage system in two governmental hospitals (Al-Shifa and EGH) were not a adequately applied, while the private sector hospitals (Al-Awda and Al-Quds) were not differ from governmental hospital, even though the triage system is not credited especially in Al-Awda hospital. Furthermore these private sector hospital developed a good management strategies in coping with emergency crises like consistent teamwork which approved it self during the recurrent war events.

This study revealed that the current specified triage area space and capacity in the hospital EDs is not sufficient this is clearly appeared during crisis or mass causalities. In addition to that there is no recurrent rreviewing for the designation of different ED's areas and there is no sharing for ED’s staff regarding their opinion in the current design.

Half of providers reported that they are not conducting a periodical drill or simulation for triaging mass causality events that involves a large number of injured patients. Furthermore, public awareness regarding the concept and importance of triage system was limited. Moreover, co-workers such as stretcher worker who are trained for handling and moving patients are available at the triage area to some extent but not enough. The beds capacity in triage area is limited in proportion to the number of patients and the injured, moreover, there are no enough number of trolleys, stretchers

and wheel chairs for transporting, carrying and evacuating patients and injured at triage area.

Documentation and registration still need improvement as reported by health care providers, this defect attributed to shortage in staff as well as equipment and forms. Additionally, there is lack of communication tools in general and at triage area in specific. Additionally, nearly half of providers reported that there is no reviewing of ED standards and protocols related to triage system, as well as the rest of Ed's standards and protocols.

The security staff reported that there is no enough number of security personnel to cover the work at the hospital ED, 24hr. /7 days a week. In addition the staff reported that they are unable to control the number of visitors in ED when ED is crowded.

5.2 Recommendations

- The current triage system should be reformed and integrated in all hospital EDs as a part of its standardized system.
- Sharing the ED staff in any reconstruction or modification regarding the design or procedures.
- Conducting a periodical drill or simulation for managing a mass causality for testing the hospital emergency plan and redness of ED.
- Increasing public awareness regarding the concept and importance of triage system through the media and brochures targeting the community groups at universities, schools, and mosques.
- Providing co-worker such as stretchers worker who are trained for handling and moving patients in triage area.

- Increasing the functional capacity of triage area in general and providing a well prepared alternative area in case of mass causality triage, including reasonable numbers of beds, trolleys, stretchers and wheel chairs for transporting, carrying and evacuating patients.
- Establishment of a good data base system and standardization of documentation, forms, and unifying the registry system in all hospitals EDs in Gaza Strip.
- Providing suitable communication tools such as intercom, wireless, direct telephone, and pagers at triage area.
- Staffing the ED with suitable number of security to cover the work at the hospital ED, 24hr./7 days a week, for controlling the number of visitors when ED is crowded.
- Standardized the emergency system in the governmental and private sectors including standards, protocols, and procedures
- In the scope of the end results of this study the researcher recommended that there is essential need for unity of command to lead the emergency health services in the country.

5.3 Suggestions for future researches:

- A comprehensive study for evaluating EDs, performance and indicators such as door to doctor time, patient waiting time and door to admission time, and length of stay.
- A comparison study for triage system after one year or more to evaluate action processes.

References

Advanced Life Support Group (2002). *Major incident management and medical support: the practical approach*. London: BMJ Publishing Group.

American Hospital Association (2002). *Emergency department overload: a growing crisis*. The results of the American hospital association survey of emergency department and hospital capacity.

Anderson-Shaw L., Ahrens W., and Fetzer M. (2007). Ethics consultation in the emergency department. *JONA's healthcare law, ethics, and regulation*, 9(1):32–35

Australasian College for Emergency Medicine (2010). *Guidelines on the implementation of the Australasian triage scale in emergency departments.*

Australasian Health Infrastructure Alliance (2012). *Australasian Health Facility Guidelines - Part D: Infection Prevention and Control - Building Elements*, NSW Health Infrastructure,: Sydney.

Australian Collage for Emergency Medicine, (2013). *Guidelines on the implementation of the ATS in emergency departments.*

Australian Governmental Department of Health and Ageing (2012). *Emergency triage education kit*.

Ben-Tovim DI., Bassham JE., Bolch D., Martin MA., Dougherty M., and Szwarcbord M. (2007). Lean thinking across a hospital: redesigning care at the Flinders Medical Centre. *Australian Health Review*, 31(1): 10-15.

Bullard MJ., Unger B., Spence J., Grafstein E., and CTAS National Working Group. (2008). Revisions to the Canadian Emergency Department Triage and Acuity Scale (CTAS) adult guidelines. *CJEM*. 2008 Mar,10(2):136-51.

Charles A. (2007) The challenge of triage. Coronial Communiqué 2003 Dec [cited Jan 2016:.Available from: URL: http://www.vifm.org/cgi-bin/getObject. cgi?id=o249

Considine J., Bott M., and Thomas S. (2007). Do knowledge and experience have specific roles in triage decision-making?. *Academic Emergency Medicine*, 14:722-726.

Considine J., Le Vasseur SA., Charles A. (2001). *Consistency of triage in victoria's emergency departments: literature review*. Monash Institute of health services Research. report to the Victorian department of human services.

Department of Health UK (2013). *Accident and emergency departments: planning and design guidance: London.*

Domres, B (1991). Theoretische und praktische Erfahrungen mit der Triage. In *Notfallvorsorge und zivile Verteidigung*, 1(1): 40–45

Fernandes C., Tanabe P., Gilboy N., Johnson L., McNair R., and Rosenau M. (2005). Five-level triage. a report from the ACEP/ENA five-level triage task force. *Journal of Emergency Nursing*, 31(1):39–50.

FitzGerald GJ. (1990). *Emergency department triage*. Thesis accepted for the degree of Doctor of Medicine. Brisbane: University of Queensland.

FitzGerald GP., Jelinek G., Kelly AM., Murray L., and Heyworth J. (2000). *Triage*. In: Cameron, Textbook of Adult Emergency Medicine. Edinburgh: Churchill Livingstone;. p. 584–8.

Fitzgerald, GJ., Jelinek G., Scott DA., and Gerdtz MF. (2009). Emergency department triage revisited. Emergency Medicine Journal, 49:67-71

Fitzgerald, GJ., Jelinek G., Scott DA., and Gerdtz MF. (2010). Emergency department triage revisited. *Emerg Med J*, 27:86-92.

Gerdtz M., and Bucknall T. (2000). Australian triage nurses' decision-making and scope of practice. *Australian Journal of Advanced Nursing*, 18(1): 265-269.

Gerdtz M., and Bucknall T. (2001). Triage nurses' clinical decision-making: An observational study of urgency assessment. *Journal of Advanced Nursing*,35(4):550–61.

Gilboy N., Tanabe T., Travers D., and Rosenau AM. (2011). *Emergency severity index (ESI): a triage tool for emergency department care, Version 4*. Implementation Handbook 2012 Edition.

Gunn S. (1990). *Multilingual dictionary of disaster medicine and international relief.* Kluwer Academic Publishers: Dordrecht, Boston, London,. p. 81.

Ieraci S., Digiusto E., Sonntag P., et al. .(2008). Streaming by case complexity: evaluation of a model for emergency department fast track. *Emerg Med Australas*, 20: 241-249.

Institute for Clinical Evaluative Sciences. (2010). *Development of a consensus on evidence-based quality of care indicators for Canadian emergency departments.*

Institute of Medicine (2007). *Hospital-based emergency care: At the breaking point*. National Academies Press, London

Iserson KV., and Moskop JC. (March 2007). Triage in medicine, part I: Concept, history, and types. *Annals of Emergency Medicine*, 49 (3): 275–81.

Kelly AM., Bryant M., Cox L,. and Jolley D. (2007). Improving emergency department efficiency by patient streaming to outcomes-based teams. *Australian Health Review*, 31(1): 16-21.

Kelly AM., Bryant M., Cox L., et al.(2007). Improving emergency department efficiency by patients streaming to outcome based teams. *Aust Health Rev*, 31:16-21.

Kennedy K., Aghababian RV., Gana L., and Lewis PC. (1996). Triage:techniques and applications in decision making. *Annals of Emergency Medicine*, 28(2):136–44.

Liu SW., Thomas SH., Gordon JA., and Weissman J. (2005). Frequency of adverse events and errors among patients boarding in the emergency department. *Acad. Emerg. Med*., 12: 49–50.

MOH (2014a). *Hospital annual report in the Gaza Strip*

MOH (2014b). *Annual report: Population and health in the Gaza Strip*

MOH (2014c). *Annual report: Primary health care.*

MOH (2014d). *Health Sector Strategic Plan 2014-2018*

Moskop JC., and Iserson KV. (2007). Triage in medicine, part II: underlying values and principles. *Ann Emerg Med*., 49(3):282-287.

Nachreiner NM., Gerberich SG., McGovern PM., Church T P., Hansen HE., Geisser M S., et al., (2005). Impact of training on work-related assault. *Research in Nursing &Health*, 28, 67-78.

Nasir S., (2010). *Quality of emergency department Amman Elevated by the availability of essential emergency equipment*. Paper submitted in partial fulfillment of the requirments for health and community development

Ontario Hospital Association (2010). *Leading Practices in Emergency Department Patient Experience.*

Richardson D. (2009). *Access block point prevalence survey 2009, the road trauma and emergency mdicine unit,* Australian National University, on behalf of the Australasian College for Emergency Medicine.

Richardson DP., Jelinek G., Kelly AM., Murray L., Brown AFT., and Heyworth J., (2004). *Triage*. In: Cameron, Textbook of Adult Emergency Medicine. 2nd ed. Sydney: Churchill Livingstone; p. 702–705.

Rogers IR., Evans L., Jelinek GA., et al. .(1999), Using clinical indicators in emergency medicine: documenting performance improvements to justify increased resource allocation. *J Accid Emerg Med*, 16:319-21.

Stover-Baker B., Stahlman B., and Pollack M. (2012). Triage nurse prediction of hospital admission. *J Emerg Nurs*., 38(3):306-10.

The Australasian College for Emergency Medicine (2014). *Emergency department design guidelines.*

Ulrich R., and Zimringb C. (2004). *Role of the physical environment in the hospital of the 21st Century,* The Center for Health Design, Editor 2004.

Weinerman ER., Ratner RS., Robbins A., et al. (1966). Yale studies in ambulatory care V. Determinants of use of hospital emergency services. *Am J Public Health*, 56:1037-1053.

WHO (2005). *ETAT, emergency triage assessment and treatment, manual for participant*.

WHO (2007). *Mass casualty* management systems strategies and guidelines for building health sector capacity.

WHO (2008). *Operations manual for delivery of HIV prevention, care and treatment at primary health centres in high-prevalence, resource-constrained settings*: Edition 1 for Fieldtesting and Country Adaptation.

WHO, (2011). *Hospital emergency response checklist*

Wuerz R., Milne LW., Eitel DR., Travers D., and Gilboy N. (2000). Reliability and validity of a new five-level triage instrument. *Academic Emergency Medicine*, 7(3):236–42.

Wuerz R., Milne LW., Eitel DR., Wiencek J., and Simonds W. (1999). Outcomes are predicted by a new five level triage algorithm. *Academic Emergency Medicine*, 6:389-394.

Zimmermann PG. (2001). The case for a universal, valid, reliable 5-tier triage acuity scale for US emergency departments. *Journal of Emergency Nursing*, 27(3):246–54.

Annex (1) Map of Palestine

Annex (2) Consent Form

Dear participant

You have been selected in purpose to participate in this research study conducted by myself as a part of the requirements of Masters Degree in Public Health at Al-Quds University.

The study title is: **"Evaluation of triage System at emergency Department's at Gaza Hospitals"**

It has been designed to evaluate the current triage system at your Hospital. It is anticipated that the results of this study will help in evaluating how effective is the current triage system and how it comply identifying the strengths and weaknesses of the applied triage system thus setting the suggestions for better performance.

Your participation in this study is totally optional, you have the right to accept or refuse sharing in this study, and you have the right to withdraw any time.

You will be asked some questions; this might take about 15 minutes out of your time.

Your answers of questions and the result of the Questionnaire will be confidential, and the results will be groups and not individual answers.

Thank you for patience and cooperation.

The researcher

Mr. Ashraf Issam Helewa

Mobile 0595544416

School of Public Health

Annex (3): Helsinki Committee Approval Letter

المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

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

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

Helsinki Committee
For Ethical Approval

Date: 05\10\2015 **Number:** PHRC/HC/63/15

Name: Ashraf Essam Helewa **الاسم:** أشرف عصام حليوة

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

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:-

Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/63/15 in its meeting on 05/10/2015

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

Signature

Member **Member**

Chairman

Genral Conditions:-

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

Specific Conditions:-

The subject was approved following the World Medical Association Declaration of Helsinki-Ethical principles for medical research involving human subjects, adopted by the 18th World Medical Association General Assembly, Helsinki, Finland, June 1964 and amended by the 59th WMA General Assembly, Seoul, Korea, October 2008.

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

Annex (4): Al-Quds University Approval Letter of Request

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ: 2015/8/22
الرقم/: ك ص ع –غ/85/2015

حضرة الدكتور ناصر أبو شعبان المحترم
مدير عام تنمية القوى البشرية–وزارة الصحة

تحية طيبة وبعد،،،

الموضوع: مساعدة الطالب أشرف عصام حليوة

يقوم الطالب المذكور أعلاه بإجراء بحث بعنوان:

Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals

كمتطلب للحصول على درجة الماجستير في السياسات والإدارة الصحية وعليه نرجو التكرم بالموافقة والايعاز لمن يلزم لسماح بتسهيل مهمة الطالب لجمع البيانات الخاصة ببحثه من العاملين بقسم الطوارئ بمجمع الشفاء الطبي ومستشفى غزة الأوربي التابعة لإدارتكم الموقرة.
علماً بأن المعلومات ستكون متوفرة لدى الباحث والجامعة فقط وسنطلعكم على النتائج في حينها .

و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد
منسق عام برامج الصحة العامة
فرع غزة

نسخة:
- الملف

Jerusalem Branch/Telefax 02-2799234
Gaza Branch/Telefax 08-2644220 -2644210
P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234
فرع غزة / تلفاكس 08-2644220-2644210
ص.ب. 51000 القدس

Annex (5) Ministry of Health Permission Letter

The Palestinian National Authority
Ministry of Health
Directorate General of Human Resources Development

السلطة الوطنية الفلسطينية
وزارة الصحة
الإدارة العامة لتنمية القوى البشرية

الرقم :..... التاريخ:2015/09/14م

الأخ / د. عبد اللطيف الحاج المحترم،،،

مدير عام المستشفيات

السلام عليكم ورحمة الله وبركاته،،،

الموضوع/ تسهيل مهمة باحث

بخصوص الموضوع أعلاه، يرجى تسهيل مهمة الباحث/ أشرف عصام حليوه الملتحق ببرنامج ماجستير الإدارة والسياسات صحية – جامعة القدس في إجراء بحث بعنوان :-

"Evaluation of Triage System in Emergency Departments at the Gaza Strip Hospitals"

حيث الباحث بحاجة لتعبئة استبانه من جميع فئات العاملين في أقسام الاستقبال و الطوارئ في مستشفيات قطاع غزه، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، و دون تحمل الوزارة أي أعباء أو مسئولية.

وتفضلوا بقبول التحية والتقدير،،،

د. ناصر رأفت أبو شعبان
مدير عام تنمية القوى البشرية

وزارة الصحة
تنمية القوى البشرية
صادر 15/1265
التاريخ 2015/9/16

صورة لـ/
- الإدارة العامة للرقابة الداخلية
- صاحب العلاقة

Gaza Tel / 08-2827298 Fax / 08-2858109 Email / hrd@moh.gov.ps

Annex (6) The Interview Questionnaire (English)

Personal and Demographic Data:

Work Place:

□ Shifa Medical Compartment. □ Alquds Hospital.

□ Gaza European Hospital. □ Alawda Hospital.

Residence Place:

□ Gaza Governorate. □ North Governorate. □ Middle area Governorate.

□ Khnyounis Governorate. □ Rafah Governorate.

Gender:

□ Male. □ Female.

Age:

□ 20 - 30. □ 31 - 40. □ 41 - 50. □ < 50.

Profession:

□ Doctor. □ Nurse. □ Administrative.

□ Security.

Level of Education:

□ Diploma. □ Bachelor . □ Master. □ Doctorate.

Years of Experience:

□ 1- 5. □ 5 - 10. □ 11 - 15. □ < 15.

Triage system domains (For nurses and Physicians)

#	Item – البيـــــان	□ Yes	□ To some extent	□ No
Structure & Design				
1-	Does the current structure and design of the ED's facilitate triaging the patients and injured people?	□	□	□
2-	Dose the surface area assigned for triage area facilitate the flow of patients and injured people?	□	□	□
3-	Does the current surface area assigned for triage have enough capacity to triage a big number of causalities?	□	□	□
4-	Is there a other place beside / near by the triage area can be used for triage in major events and war situations؟	□	□	□
5-	Does the current hospital and it's ED, design allow for free movement of ambulance vehicles in one way direction (separated entrance and exit pathway)?	□	□	□
6-	Is there a separated ED, entrance from hospital entrance?	□	□	□
7-	Is there a separated entrance for those patients transported by ambulance vehicles and those who transported by private cars?	□	□	□
8-	Is there a separated entrance for those patients transported by foot?	□	□	□
9-	Are there enough places in front of the ED, allow for transitional parking for ambulance and private vehicles to off and load patients and injured people?	□	□	□
10-	Is there a place at the entrance bay close to ambulance parking area designed for storing equipment such as (trolleys, stretchers, wheel chairs) that needed for patients and injured transportation and handling?	□	□	□
11-	Is there enough protection measures provided by police or security personnel in the triage area for the staff, patients and attendance in case of violence eruption?	□	□	□
12-	Are the security or police personnel who provide protection at the triage area wear official police or civil uniform?	□	□	□
13-	Is there enough control from the police or security personnel at the entrance, exit, corridors and the elevators at the ED, as well as the hospital?	□	□	□

14-	Does the current ED, design provide a quick access to other areas and parts inside the ED, and the hospital such as " ICU, OR, Imaging and Lab services"?	□	□	□
15-	Does the triage area has enough and suitable place for patients, injured and their relatives until they received the care?	□	□	□
16-	Do you have enough signboards, signage, posters at the hospital, emergency department entrance and the triage area to guide the patient's and their families?	□	□	□
17-	Does the current design of ED, and triage room allow fast tracking of patient at the different stages of interventions?	□	□	□
18-	Is there a reviewing for the designation of different ED's areas and surveying the ED's staff opinion in particular and the hospital staff in general?	□	□	□
Human Resources				
	Item	□ Yes	□ To some extent	□ No
1-	Are there enough number of doctors to cover the work at the ED, 24hr./7 days a week.	□	□	□
2-	Does All medical specialties are available 24hr./7 days a week.	□	□	□
3-	Are there enough number of nurses to cover the work at the ED, 24hr./7 days a week.	□	□	□
4-	Is there enough number of well-qualified professional nurses to cover the work at the triage area?	□	□	□
5-	Does in emergency situations and big events which involved a big number of causalities they provided for triage area with additional staff support?	□	□	□
6-	Did the technical and administrative crews receive the suitable and enough training to perform the triage process?	□	□	□
7-	Do you briefers a special uniform or vest to distinguish the ED;s staff specially those at the triage area whether doctors, nurses or administrative or security personnel?	□	□	□
8-	Are there any mechanism/measurements for patients and public awareness regarding the concept and importance of triage system?	□	□	□
9-	Do you conduct a periodical drill or simulation for triaging mass causality events that involves a large number of injured patients?	□	□	□

10-	Are there co-workers such as stretcher workers who are trained for handling and moving patients are available at the triage area?	□	□	□
Equipment & Machines				
	Item	□ Yes	□ To some extent	□ No
1-	Are there enough numbers of equipment and instrument that needed to provide care for patients and injured people at the triage area?	□	□	□
2-	Are there enough amounts of drugs and disposals available at the triage area to provide first aid and urgent care for patients and injured people?	□	□	□
3-	Is there a system in place for periodical maintenance and follow up for this equipment, which guarantee its work and efficacy?	□	□	□
4-	Do you have enough storing places for these equipment and instilments to protect it from damage and being lost?	□	□	□
5-	Are there enough number of beds at the triage area in proportion to the number of patients and the injured?	□	□	□
6-	Are there enough number of trolleys, stretchers and wheel chairs for transporting, carrying and evacuating patients and injured at triage area?	□	□	□
7-	Does the equipment that needed for transporting patients and injured in and out of the triage area are available such as portable oxygen cylinders and others?	□	□	□
8-	Do you have a clear mechanism for checking equipment redness and competency at the triage area?	□	□	□
9-	Is there a clear mechanism in place for quick access to well-equipped ambulance vehicles for patients and injured transportation whenever needed?	□	□	□
Registration & Documentation				
	Item	□ Yes	□ To some extent	□ No
1-	Does the forms that needed for documentation, triaging and data of patients and injured are available in accordance with the designed system of the ED?	□	□	□
2-	Does the current triage system use the four or six color scale tags or other scale?	□	□	□

3-	Is there a clear mechanism for documenting triage process and patient registration manually "on paper forms"?	□	□	□
4-	Is there a clear mechanism for documenting triage process and patient registration electronically?	□	□	□
5-	Does the patient sent from the triage area to the initial assessment area of the ED, with special form?	□	□	□
6-	Does the patient sent from the triage area to the initial assessment area of the ED, with medical attendance?	□	□	□
7-	Are there special forms to document the juridical and legal suspicious cases.	□	□	□
8-	Is there a registration system for unknown cases during disasters or accidents?	□	□	□
9-	Is there a registration system for critical cases at bedside?	□	□	□
10-	Is there a clear mechanism for dealing with dead bodies?	□	□	□
11-	Is there a clear mechanism for dealing with remnants and amputated body parts?	□	□	□
12-	Do the available documentation tools meet the demands?	□	□	□
13-	Is there good utilization of patients and injured data for sitting performance indicators, quality assurance and the purpose of scientific research?	□	□	□
14-	There are periodical publishing and auditing of the statistical performance of the hospital ED.	□	□	□
Communication				
	Item	□ Yes	□ To some extent	□ No
1-	Is there a clear mechanism of communication for requesting the human and logistic support to triage area?	□	□	□
2-	Does the necessary wire and wireless communication means available and sufficient at the triage area in specific and the ED, in general such as "Phone line, Intercoms, Mobiles, Wireless, pager"?	□	□	□
3-	Is there is a pre-hospital alert system?	□	□	□
4-	Is there is a clear mechanism in place for communication between the nurses in triage area, the ED's staff and the ED's different areas as well as the other hospital departments?	□	□	□
5-	Is there a pre-prepared contact list in hand with the names and numbers of ED's staff for call	□	□	□

	when needed?			
6-	Is there a clear mechanism for activating hospital emergency plan?	□	□	□
7-	Is there a clear mechanism of (communication) Line of Communication in emergency situation?	□	□	□
Standards & Protocols				
	Item	□ Yes	□ To some extent	□ No
1-	Is there a registered Triage system at your hospital ED's?	□	□	□
2-	Is there a written standard or protocol about / for the current triage system?	□	□	□
3-	Does the staff receive training for applying this protocol?	□	□	□
4-	Was this standard or protocol published, printed and distributed to all ED's staff and the concerned people who apply the system?	□	□	□
5-	Was this standard or protocol published, printed and distributed to the patients and attendance at the ED, explaining the mechanism of triage in accepting manner?	□	□	□
6-	Who is assigned to perform the triage process? □ Doctor. □ Nurse. □ Both. □ Others. Please Specify: _____.	□	□	□
7-	Is there a well-qualified and skilled nurse assigned to perform the triage process?	□	□	□
8-	Does the period that patient waits at the triage hall until receiving treatment according to triage system reasonable?	□	□	□
9-	Is there a hospital emergency plan that clarifies the triage process during Mass - Causality Incidence?	□	□	□
10-	Does the ED's staff aware and participate in setting the hospital emergency plan.	□	□	□
11-	Is there a clear mechanism or protocol for activating hospital emergency plan?	□	□	□
12-	Is there a clear standard or protocol for training the technical and administrative staff on how to perform triage process?	□	□	□
13-	Did you perform community/public a weariness program regarding the concept and importance of triage system?	□	□	□
14-	Are there available standards and protocols regarding transporting and referring patients inside and outside the hospital?	□	□	□
15-	Are there a clear protocols regarding admitting and discharging patients?	□	□	□

16-	Is there a periodical reviewing for standards and protocols related to triage system, as well as the other standards and protocols as needed?	□	□	□
17-	Are there general indicators to Measure the Ed's performance in general and triage area in particular?	□	□	□
18-	Do you take advantage and withdraw lessons from the evaluation process after each events?	□	□	□

Triage system domains (For Security staff)

Security Personnel Questionnaire Partition:				
	Item	□ Yes	□ To some extent	□ No
1-	Is there a place assigned for security personnel at or near by the triage area?	□	□	□
2-	Are there enough number of security/police to personnel cover the work at the hospital ED, 24hr./7 days a week?	□	□	□
3-	Is there a direct communication means between the ED's staff and the security/police personnel for quick call in case of violence eruption has been occurs?	□	□	□
4-	Do the security/police personnel have a plan to control the entrance, exit, corridors and the elevators at the ED, as well as the hospital?	□	□	□
5-	Are they involved in sitting the emergency plan for the hospital in general and ED's in particular?	□	□	□
6-	Do they have training, drill or simulation on emergency situation that involved large number of causalities rushing to ED?	□	□	□
7-	Do the current security/police services provide enough level of protection to the ED's staff, patients and attendance?	□	□	□
8-	Does the current security/police plane provide the suitable support or backup whenever needed by staff in a timely manner?	□	□	□

Triage system domains (For Administrators staff)

Administrative Personnel Questionnaire Partition:				
	Item	□ Yes	□ To some extent	□ No
1-	Is there a place assigned for administrative personnel at or near by the ED's area?	□	□	□
2-	Are there enough number of administrative to personnel cover the work at the hospital ED, 24hr./7 days a week?	□	□	□
3-	Is there a direct communication means between the ED's staff and the administrative personnel for quick call in case support needed?	□	□	□
4-	Do the administrative personnel have a plan to manage the crises situation at the ED, as well as the hospital?	□	□	□
5-	Are they involved in sitting the emergency plan for the hospital in general and ED's in particular?	□	□	□
6-	Do they have training, drill or simulation on emergency situation that involved large number of causalities rushing to ED?	□	□	□
7-	Do the current administrative services provide enough level of management and cooperation with the ED's staff, patients and attendance?	□	□	□
8-	Does the current administrative plane provide the suitable support or backup whenever needed by staff in a timely manner?	□	□	□

Researcher / Ashraf Issam Helewa
Mobile (5544416)

Thank you for your generous support in the process of scientific

Annex (7): Key informative interview questions

Dear Sir,

You have been selected in purpose to participate in this research study conducted by myself as a part of the requirements of Masters Degree in Public Health at Al-Quds University.

The study title is: **"Evaluation of triage System at emergency Department's at Gaza Hospitals"**

It has been designed to evaluate the current triage system at your Hospital. It is anticipated that the results of this study will help in evaluating how effective is the current triage system and how it comply identifying the strengths and weaknesses of the applied triage system thus setting the suggestions for better performance.

Your participation in this study is totally optional, you have the right to accept or refuse sharing in this study, and you have the right to withdraw any time.

You will be asked some open questions; this might take about 15 minutes out of your time.

Thank you for patience and cooperation.

The researcher

Mr. Ashraf Issam Helewa

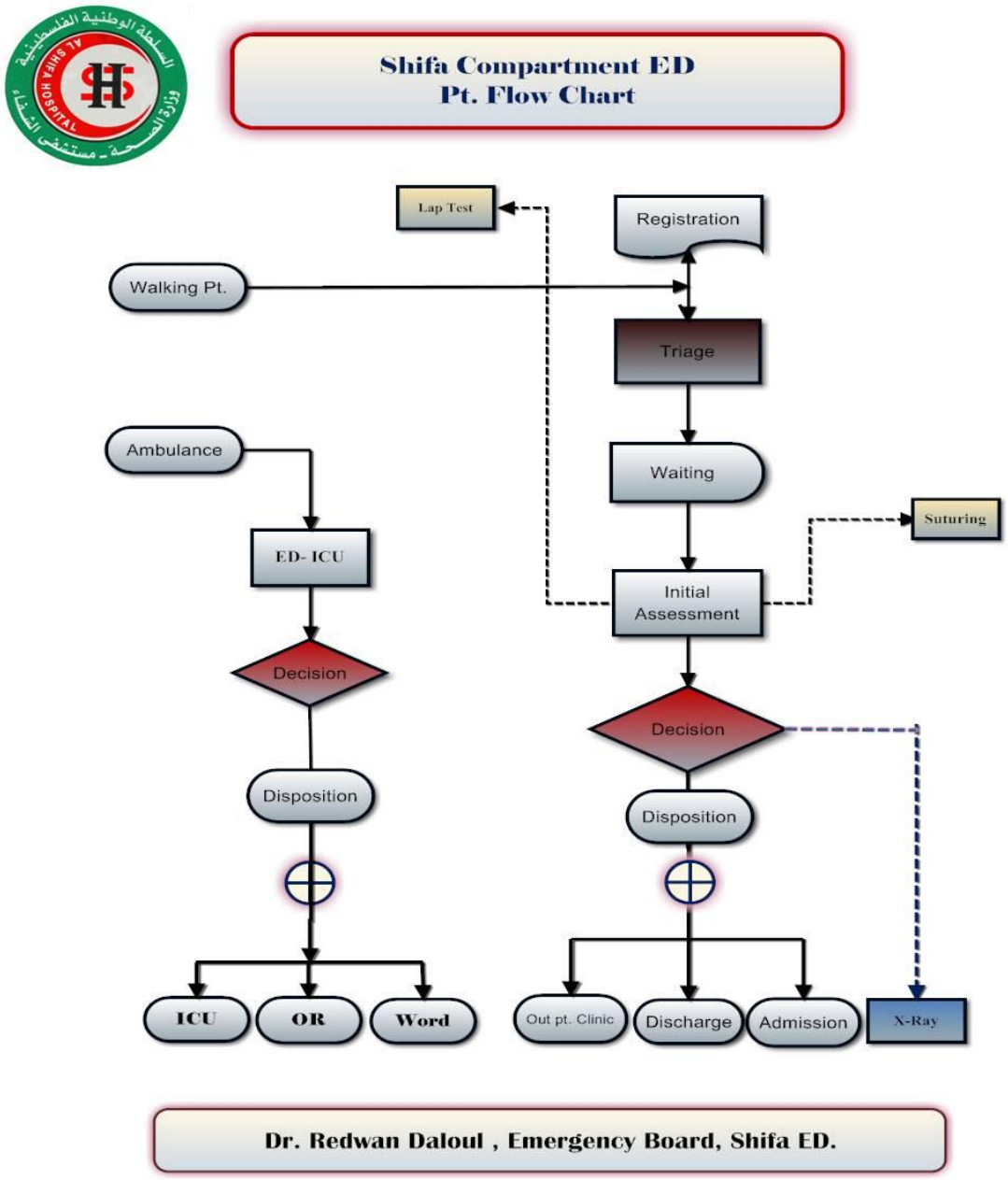
***** Key informative Questions**

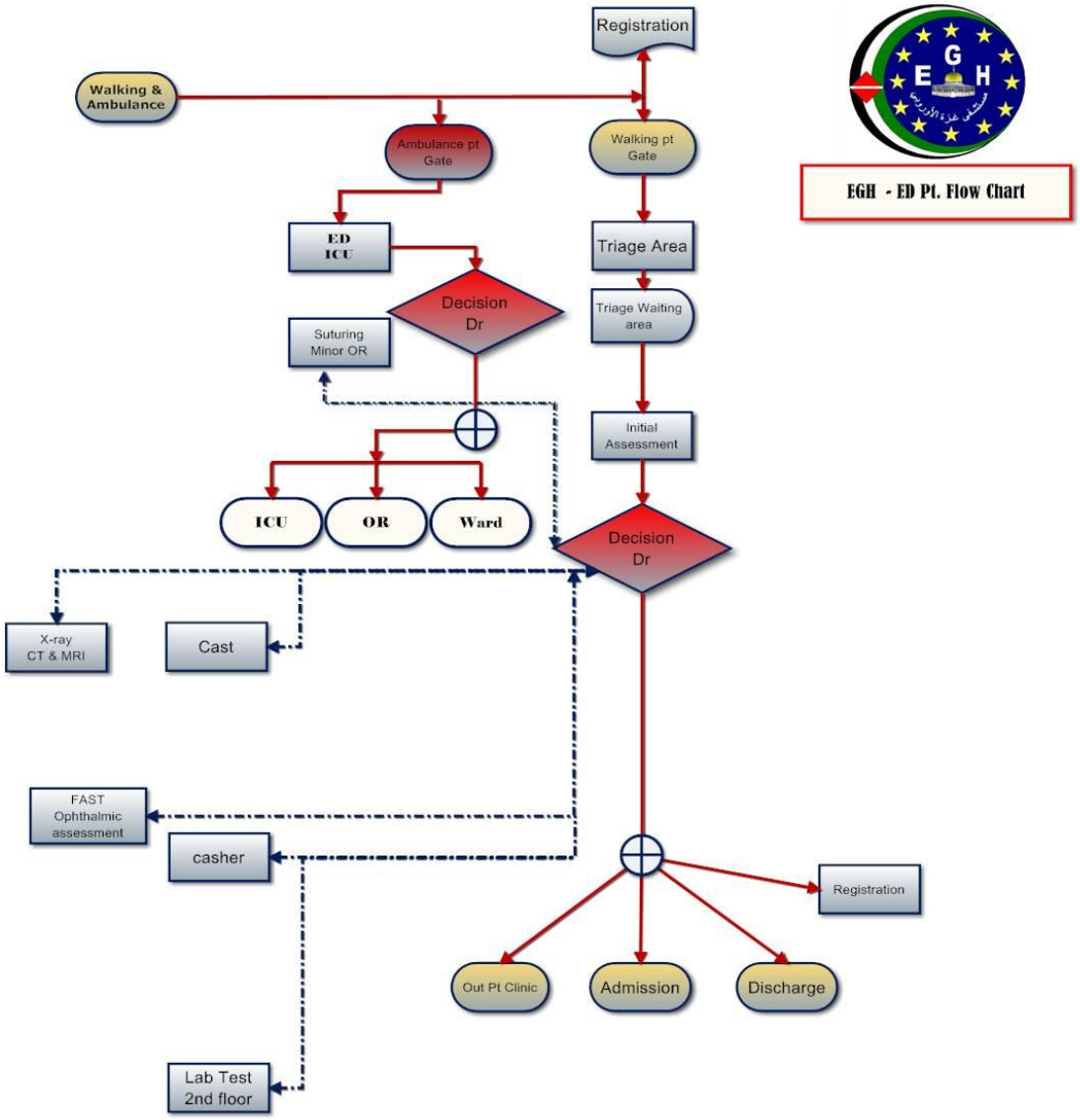
- The current scope of practice for ED triage system.
- The challenges and barriers that affect application of the triage system, How to improve the performance of the current system from the interviewee perceptions, and
- How the Current TS improve the quality of emergency services in term of time effort and urgency.

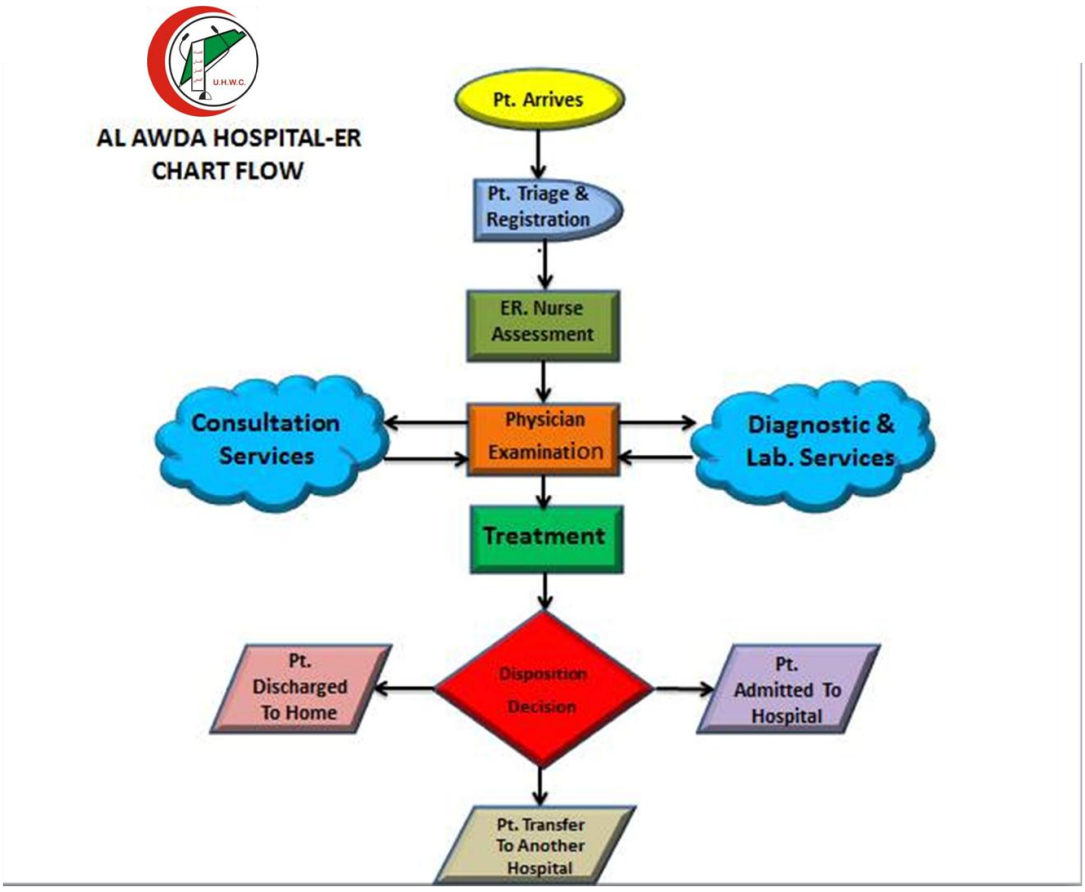
Annex (8): Names of expert

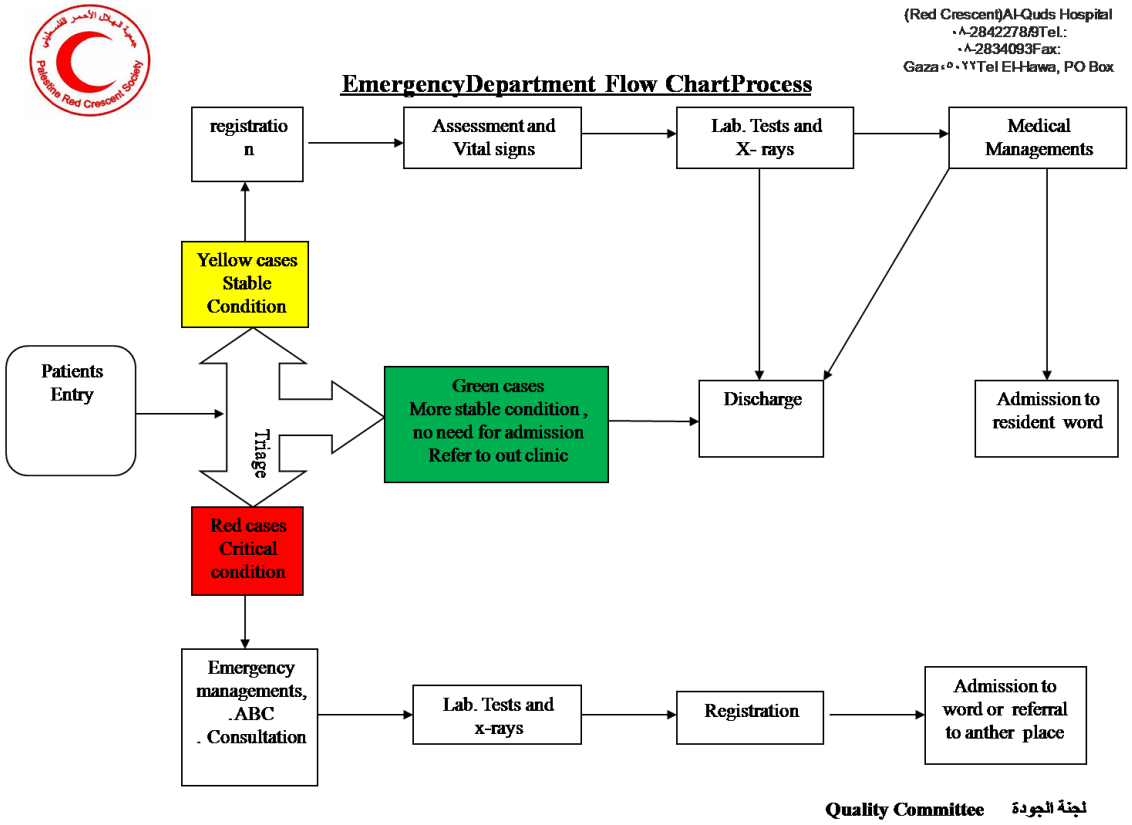
1	Dr. Bassam Abu-Hamad	Al-Quds University
2	Dr. Yehia Abed	Al-Quds University
3	Dr. Yousif Al-Jeish	IUG
4	Dr. Khitam Abu-Hamad	Al-Quds University
5	Dr. Nasser Abu-Nour	ICU
6	Dr. Yousif M. Awad	Palestine University
7	Dr. Ashraf El-Jeddi	ICU
8	Dr. Nasser Abu-Shaban	MOH
9	Dr. Subhi Skik	Al-Shifa Hospital Complex
10	Dr. Mohammed Al-Attar	Ministry of Interior
11	Dr. Ayamn Al-Sahabani	Al-Shifa Hospital Complex
12	Dr. Radwan Daloul	Al-Shifa Hospital Complex

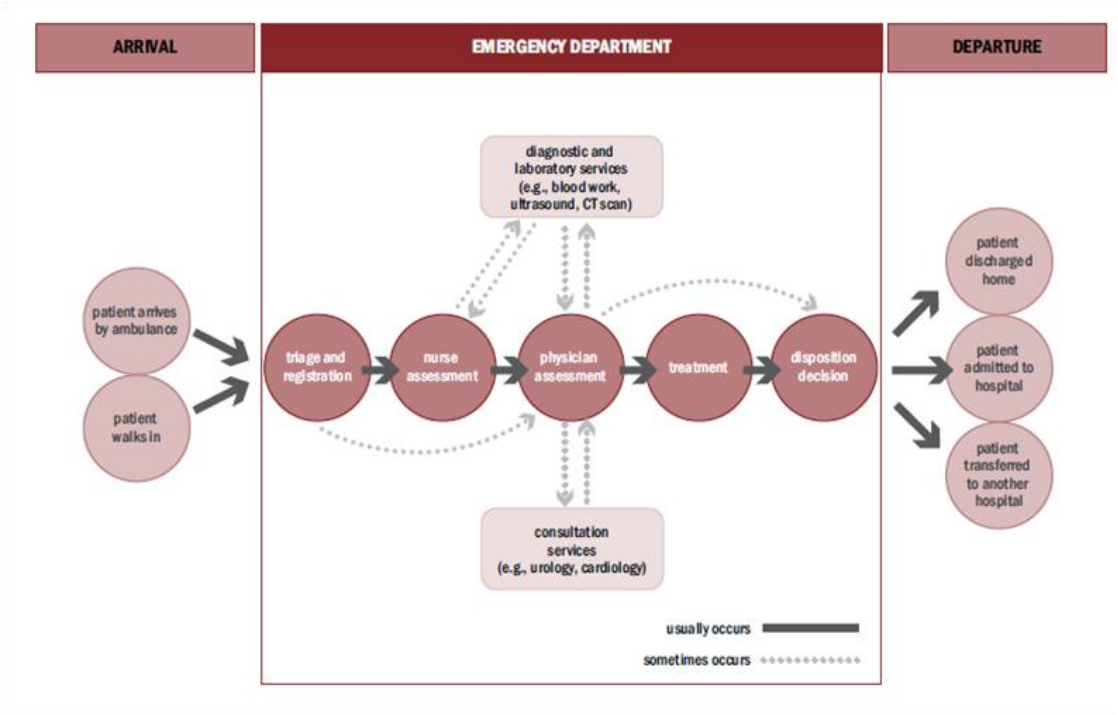
Annex (9): Patient flow and main hospital entrance




EGH - ED Pt. Flow Chart
Registration
Walking & Ambulance
Ambulance pt Gate
Walking pt Gate
ED ICU
Triage Area
Decision Dr
Triage Waiting area
Suturing Minor OR
Initial Assessment
ICU
OR
Ward
Decision Dr
X-ray CT & MRI
Cast
FAST Ophthalmic assessment
casher
Registration
Out Pt Clinic
Admission
Discharge
Lab Test 2nd floor


AL AWDA HOSPITAL-ER
CHART FLOW
Pt. Arrives
Pt. Triage & Registration
ER. Nurse Assessment
Consultation Services
Physician Examination
Diagnostic & Lab. Services
Treatment
Pt. Discharged To Home
Disposition Decision
Pt. Admitted To Hospital
Pt. Transfer To Another Hospital


(Red Crescent)Al-Quds Hospital
٠٨-2842278/9Tel.:
٠٨-2834093Fax:
Gaza٤٥٠٢٢Tel El-Hawa, PO Box
EmergencyDepartment Flow ChartProcess
registratio n
Assessment and Vital signs
Lab. Tests and X- rays
Medical Managements
Yellow cases Stable Condition
Patients Entry
Triage
Green cases More stable condition , no need for admission Refer to out clinic
Discharge
Admission to resident word
Red cases Critical condition
Emergency managements, .ABC . Consultation
Lab. Tests and x-rays
Registration
Admission to word or referral to anther place
Quality Committee
لجنة الجودة



Ideal one way patient flow

AL-Quds ED Entrance

AL-Awda ED Entrance


Shifa Compartment Hospitals & ED Main Entrance


European Gaza Hospital (EGH) & ED Main Entrance

تقييم نظام الفرز بأقسام الطوارئ في مستشفيات قطاع غزة

إعداد: أشرف حليوة

إشراف: د. رضوان بارود

مقدمة:

يعتبر نظام الفرز أحد المكونات الرئيسية للخدمات الصحية الطارئة بأقسام الطوارئ بالمستشفيات. وهي عنصر أساسي من عناصر الرعاية الطبية الحديثة حيث أنه مخصص لتصنيف الحالات حسب الأولوية من حيث درجة الخطورة وعمل التدخل المناسب لكل حالة حسب درجة خطورتها، بالإضافة إلى أهميته بعمل توازن بين الطلب الغير محدودة على خدمات الطوارئ مقابل محدودية الإمكانيات المتاحة.

الهدف:

يتمثل الهدف العام من هذه الدراسة في تقيم نظام الفرز بمستشفيات قطاع غزة بهدف تحسين جودة الخدمات المقدمة في أقسام الطوارئ وذلك لتلبية احتياجات وتوقعات المرضي وذويهم لتكون هذه الدراسة وسيلة لوزارة الصحة لتطوير والعمل على تحسين هذه الخدمة.

المنهجية:

تصميم هذه الدراسة وصفي، تحليلي، مقطعي، بهدف تقيم نظام الفرز بمستشفيات قطاع غزة ، حيث استهدفت الدراسة 252 موظف يعملون بأقسام الطوارئ بمستشفيات القطاع (الشفاء، غزة الأوروبي، العودة، القدس). وقد تم جمع البيانات من خلال استبانة محكمة اعتمدت على قراءة الأدبيات المتعلقة بهذه الشأن مع معدل استجابة وصل إلى 86.0%، وأيضاً تم جمع البيانات من خلال إجراء مقابلات مع صناع القرار بالمستشفيات المستهدفة في الدراسة حيث بلغ عددهم 12 موظف تتدرج مواقعهم بين مدير عام المستشفى، رئيس قسم الطوارئ الطبي و رئيس تمريض قسم الطوارئ. وقام الباحث بإدخال البيانات على البرنامج الإحصائي "SPSS" ومعالجتها ومن ثم تحليلها باستخدام طرق متعددة.

النتائج:

أظهرت النتائج أن غالبية عينة الدراسة كانوا من الذكور بنسبة بلغت (70%)، وأن الفئة العمرية بين 20–30 سنة شكل أيضاً أعلى نسبة، بالإضافة إلى أن غالبية المبحثين يحملون شهادة البكالوريوس. كما أشارت النتائج أن معدل التقييم الكلي لنظام الفرز بلغ 63.7%، حيث حصل محور التسجيل والتوثيق بالإضافة إلى محو التواصل على أعلى نسبة (65.3%)، في المقابل حصل محور المعايير والبروتوكولات على أقل معدل حيث بلغ 61.6%، تلاه محور الموارد البشرية بمعدل 62.3%. ومن وجهة نظر الإداريين نحو تقييم نظام الفرز بلغت النسبة حوالي 78.2% في حين بلغت 71.0% من وجهة نظر الأمن. وقد وجود فروق ذات دلالة إحصائية لصالح التمريض مقارنة بالأطباء. أيضاً وجود فروق ذات دلالة إحصائية لصالح المستشفيات الخاصة مقارنة بالمستشفيات الحكومية.

التوصيات:

يوصي الباحث في هذه الدراسة بإعادة إصلاح نظام الفرز الحالي و دمجه كنظام موحد في عمل كافة أقسام الطوارئ بالمستشفيات كذلك بما أن خدمات الإسعاف و الطوارئ جزء لا يتجزأ من المنظومة يجب العمل على تطبيق نظام فرز موحد لخدمات الطوارئ ما قبل المستشفى ، عقد وبشكل دوري تدريب أو محاكاة حول كيفية التعامل مع و إدارة الأحداث متعددة الإصابات وذلك لاختبار مدى جهوزية أقسام الطوارئ، زيادة وعي الجمهور فيما يتعلق بمفهوم و أهمية نظام الفرز، توفير عمال فنيين بمنطقة الفرز مدربين على حمل ونقل المرضى و المصابين، زيادة السعة الوظيفية لمنطقة الفرز بشكل عام و توفير مناطق بديلة مجهزة في حال الأحداث الكبرى، ويشمل ذلك عدد كافي من الأسرة و المعدات و التروليات و الشيالات وكراسي العجلات لنقل وحمل و إخلاء الجرحى و المصابين، تزويد أقسام الطوارئ بالعدد الكافي من أفراد الأمن لتغطية العمل على مدار الساعة، تخصيص طواقم طبية وفنية ثابتة للعمل بأقسام الطوارئ ووضع السياسات المناسبة للحفاظ عليهم في أماكن عملهم و منحهم الحوافز اللازمة ، إعادة النظر في ترتيب تصميم أقسام الطوارئ بحيث يكون حركة المريض باتجاه واحد دون رجوع المريض للخلف، التنسيق و التكاملية بين القطاع الحكومي و الخاص و توحيد المعايير.