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Assessment of Governmental Hospitals Resilience during Crises in Gaza Governorates: Challenges and Implication

تقييم صمود المستشفيات الحكومية أثناء الأزمات في محافظات
غزة: التحديات والأثر

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إقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

Assessment of Governmental Hospitals Resilience during Crises in Gaza Governorates: Challenges and Implication

تقييم صمود المستشفيات الحكومية أثناء الأزمات في محافظات غزة: التحديات والأثر

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بناء على موافقة عمادة البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ محمد شعيب عطا الخصري لنيل درجة الماجستير في برنامج إدارة الأزمات والكوارث وموضوعها:

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Assessment of Governmental Hospitals Resilience during Crisis in Gaza Governorates: Challenges and Implications

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إدارة المكتبة المركزية

توقيع الطالب

محمد نصيب عطا الخضري

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Abstract

Gaza Strip is frequently exposed to crises situation caused by Israeli forces, and this situation increase the need to improve hospital resilience capability to enable hospitals to deal with the increased number of casualties and the continuation of medical services. **Aim of the study:** This study aimed to assess the governmental hospitals resilience during crises in Gaza Governorates and to identify the challenges that effect hospitals resilience. **Methods:** the researcher used descriptive, analytical and cross-sectional design. The study sample is census population of key persons in Gaza governorate hospitals consisted of 190 persons from 6 governmental hospitals in Gaza governorates. **Data collection:** the researcher developed his own tools to evaluate the hospitals resilience. The questionnaire was validated by a group of experts and pilot study implemented on 20 participants. Cronbache alpha coefficient was 0.952. **Results:** the results showed that the highest domain was "continuity of essential services" with weighted mean 65.11%, followed by "recovery and adoption" with weighted mean 63.74%, followed by "hospital crises preparedness" with weighted mean 61.81%, followed by "resources management" with weighted mean 60.29%, and the weakest domain was "hospital safety and vulnerability" with weighted mean 57.18%. Also, 33.3% of the participants reported that command and control is the highest challenge that hospital resilience is facing, followed by human resources 21.7%, communication 20.9%, post-crisis recovery 19.8%, surge capacity 18.1%, safety and security 15.9 %, logistics and supply management 15.5%, continuity of essential services 13.1% and triage 3.7%. There are no statistical deferanceses between age or gender and hospital resilience,while there are statistical significant deferances between residency and hospital resilience for middle area and there are significant deferances between profession and hospital resilience for physician and pharmacy, there are no statistical significant deferances between hospital resilience and education level or years of experience , while ther is significant deferances between hospital resilience and hospitals in hospital safty and vulnerability for Al Najjar and Al Aqsa hospitals ,continuity of essential services for Al Shifaa and Al Najjar hospitals and recovery and adoption for Al Najjar and Al Shifa hospital. **Conclusion and recommendations:** the study conclude moderate level of hospital resilience among governmental hospitals with average score 62.53%. The study recommended that some necessary modifications in the health system are essential to improve the level of hospital resilience during crises.

ملخص الدراسة

كثيراً ما يتعرض قطاع غزة للأزمات التي تسببها القوات الإسرائيلية، وتزيد هذه الحالة من الحاجة إلى تحسين قدرة المستشفيات على الصمود، لتمكين المستشفيات من التعامل مع العدد المتزايد من الإصابات، وتقديم الخدمات الطبية المستمرة. **الأهداف:** هدفت هذه الدراسة إلى تقييم مدى مرونة المستشفيات الحكومية خلال الأزمة في محافظات غزة، وتحديد التحديات التي تؤثر على مرونة المستشفيات. **الطريقة والاجراءات:** استخدم الباحث المنهج الوصفي التحليلي والتصميم المستعرض. وعينة الدراسة هي أصحاب القرار في مستشفيات قطاع غزة، وتتألف من ١٩٠ شخصاً رئيسياً من ٦ مستشفيات حكومية في محافظات غزة. لجمع البيانات، قام الباحث بتطوير أدواته الخاصة لتقييم قدرة المستشفيات على الصمود. تم التحقق من صحة الاستبيان من قبل مجموعة من الخبراء والدراسة التجريبية على ٢٠ مشاركاً، وكان معامل الارتباط الفا ٠,٩٥٢. **النتائج:** أظهرت النتائج أن أعلى مجال هو "استمرارية الخدمات الأساسية"، مع المتوسط المرجح ٦٥,١١٪، متبوعاً بـ "إعادة الأعمار والتأهيل" بمتوسط مرجح ٦٣,٧٤٪، يليه "التأهب لأزمات المستشفيات" مع متوسط مرجح ٦١,٨١٪، ثم "إدارة الموارد" بمتوسط مرجح ٦٠,٢٩٪، وكان أضعف المجالات "سلامة المستشفى ونقاط الضعف" مع متوسط مرجح ٥٧,١٨٪، كما أفاد ٣٣,٣٪ من المشاركين أن القيادة والتحكم هو أعلى تحد يواجه مرونة المستشفى، يليه الموارد البشرية ٢١,٧٪، الاتصالات ٢٠,٩٪، إعادة الأعمار ما بعد الأزمة ١٩,٨٪، زيادة قدرة المستشفيات ١٨,١٪، السلامة والأمن ١٥,٩٪، إدارة الموارد ١٥,٥٪، استمرارية الخدمات الأساسية ١٣,١٪ وفرز الإصابات ٣,٧٪، لا يوجد فروقات ذات دلالة إحصائية بين العمر والجنس ومرونة المستشفيات، في حين يوجد فروقات ذات دلالة إحصائية بين مكان الإقامة ومرونة المستشفيات في المنطقة الوسطى، وهناك فروقات ذات دلالة إحصائية بين المهنة ومرونة المستشفى بالنسبة للطبيب والصيدلاني، ولا يوجد فروقات ذات دلالة إحصائية بين المستشفى. مستوى المرونة ومستوى التعليم أو سنوات الخبرة، في حين أن هناك فروقات ذات دلالة إحصائية بين مرونة المستشفى والمستشفيات في أمان المستشفى ونقاط الضعف في مستشفيات النجار والأقصى، واستمرار الخدمات الأساسية لمستشفى الشفاء والنجار وإعادة الأعمار والتأهيل لمستشفى النجار ومستشفى الشفاء. **الخلاصة والتوصيات:** أظهرت النتائج مستوى متوسط من مرونة المستشفيات بين المستشفيات الحكومية بمتوسط درجات ٦٢,٥٣٪. وأوصت الدراسة بأن بعض التعديلات الضرورية في النظام الصحي ضرورية لتحسين مستوى مرونة المستشفى أثناء الأزمات.

Epigraph

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

"وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ
وَرَسُولُهُ وَالْمُؤْمِنُونَ ^ص وَسَتُرَدُّونَ إِلَى
عَالِمِ الْغَيْبِ وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ
تَعْمَلُونَ"

صدق الله العظيم

{ التوبة: ١٠٥ }

Dedication

This study is dedicated to:

The first teacher of all peoples, Prophet Mohammed “peace be upon him”,

My great parents who I owe my life and success, May Allah bless them,

My true half who always inspires me and was there for me to get out the best of me, my wife.

To my beloved sons: Saeed and Yazeed for their hopeful smiles.

To my brothers, friends and every person who encouraged the fulfillment of this work.

With respect and love

Acknowledgment

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I also want to thank the Ministry of Health, the General Director of Human Resource, and the General Director for Public Health for their support.

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The Researcher

Mohammed Sh. El-Khodary

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List of Abbreviations

UNISDR	United Nation International Strategies Disaster Reduction
IFRC	International Federation Red Cross
GS	Gaza Strip
WHO	World Health Organization
HIS	Health Information System
HICS	Hospital Incidence Command System
HVA	Hazard Vulnerability Analysis
ICU	Intensive Care Unit
ED	Emergency Department
CBRN	Chemical Biological Radiological Nuclear
BCP	Business Continuity Plan
EOP	Emergency Operation Plan
CM	Crises Management

Chapter 1

Introduction

Chapter 1

Introduction

Lives and livelihoods around the world are destroyed by disasters and crises where more than 1.5 billion people have been affected over the last 10 years. Disasters affect vulnerable groups such as women and children. Furthermore, it was reported that more than 0.7 million people died due to crises and disasters. Also, all levels of economic, social and civil society institutions are affected by disasters in one way or another. The total damage is estimated at more than 1.5 trillion US dollars over the past 10 years. (Aitsi-Selmi et al., 2015).

Quality is clarified by using the term resilience, although it has been explained earlier by using terms such as preparedness, continuity of services and civil protection. It was verified that it was used to assess the response to Hurricane Katrina in the United States of America, as confirmed in the 2004 Indian Ocean crisis and in the crisis that has characterized epidemics in Africa. Currently, the term "resilience" is an essential component of the United Nations International Strategy for Disaster Reduction (UNISDR) (Dawes et al., 2004).

The use of resilience significantly means a major focus on the quality of vulnerable groups' life and improve results by increased opportunities for development. In contrast, vulnerability categories increase stress for their ability to cope and resist natural hazards (O'Keefe, P., & Smith, N., 2017).

In recent times, resilience is used extensively in the management of crises and disasters as well as can be used in all areas. The adoption of the Hyogo Framework for Action 2005-2015 on 22 January 2005, also known as the UNISDR Hyogo Declaration, is a positive step. More attention to affected communities will be provided where the affected communities will be strengthened and assisted in helping themselves (International Federation of Red Cross and Red Crescent Societies (IFRC) (IFRC. 2004).

The term "resilience" is expected to be a new beginning in crisis and disaster management as well as large options will be found for decision makers. It is necessary to put many questions that are the real meaning of the term. It is essential to understand

the analyst and then how to develop resilience, how to measure and sustain it (Klein et al., 2003).

Throughout the history of the Palestinian-Israeli conflict, the crises was the dominant feature that the Palestinian health system faced, especially during Al-Aqsa Intifada which began in 2000. The Israeli occupation used its worst means of harassing the Palestinian people including the ongoing closures, repeated wars, invasions into Palestinian authority areas and the continuous bombing, making the Palestinian administration in the health system lives the crises day by day (Rebhe Eljedely, 2006).

Hospitals play an important role during crises and disasters, providing lifeline services to reduce morbidity and mortality rates. And reduce the impact of crises on public (Braun et al., 2006).

Crisis management is an effective way to provide hospital services effectively and consistently during crises and disasters whether hospitals are directly or indirectly affected by crises. (Sauer et al., 2009).

In particular, the resilience of hospitals aims to develop and strengthen the pre-crisis facilities of the hospital, so that the hospital's ability to response and restore its work prior to the disaster is ensured through a lot of resources and strategies for using these resources (McAslan, 2010).

The term "hospital resilience" in the dictionary means "*the ability to recover from (or to resist being affected by) some shock, insult or disturbance*" while the root of the term derived from a Latin word means "to jump back" (Manyena, S. B., 2006).

Health institutions, especially hospitals, must increase their resilience by developing their ability to resist, respond to and recover from crises and disasters quickly to decrease deaths and morbidity ratios. Hospital resilience is also a key part in building resilient communities and resilience to future changes and unexpected risks. (Berkes, 2007).

1.1 Context of the study

Health and humanitarian organizations working in the Gaza Strip (GS) and West Bank are significantly affected by the demographic and socioeconomic. These situations influence the services provided to the people by definite means to cope with and to overcome the ongoing emergency situation.

1.1.1 Demographic context

The total area of historical Palestine is about 27,000 Km². It locates from Rafah in the south to Ras Al-Nakoura in the north while it is bordered by the Gulf of Aqaba in the south and Lebanon in the north. It locates to the west of Syria and Jordan, and it is surrounded by Egypt and the Mediterranean Sea in the west. In 1919, Palestine was placed under the British mandate which had been terminated by Israel establishment in 1948 as an implementation of Balfour Declaration in 1917 who promised a homeland for Jews in Palestine. It resulted in uprooting most of the Palestinians from their homeland including their towns, cities, and villages and their migration to the Gaza Strip, West Bank, Lebanon, Jordan, Syria, and many other countries (PCBS, 2017).

Now Palestine is limited to two geographically separated areas, Gaza Strip and West Bank with a total area of 6279 km², which represents 22% of the historical Palestine (MOH, 2006).

In the Palestine, 41.9% of the population is refugees which is about 2.05 million. 773,000 of the refugees live in the West Bank representing 26 % of the West Bank total population. Besides, 1.28 million of the refugees live in Gaza Strip that represent 66.7% of the Gaza Strip total population (WHO. 2017).

Gaza Strip consist of five governorates: North of Gaza, Gaza city, Middle area, Khan Younis and Rafah. The population under 17 years old in Gaza governorates is (47.9 %) and those of 60 years and more is (4.3 %) (PCBS, 2017).

1.1.2 Socio-economical context

The economy of Palestine is cruelly miserable comparing with the pre-intifada era. The World Bank assessed the gross domestic production per capita (GDP) to be 23% lower than what reported in 1999. Real GDP per capita was 35% after accounting for

population growth which was below its pre-intifada level (World Bank, 2004). The financial situation of the Palestinian Authority has become gradually unworkable mostly as a result of uncontrolled government consumption, particularly a rapidly increasing public sector wage bill, increasing social transfer schemes and increasing “net lending”. Also, the miserable economy resulted in lower tax income level (World Bank, 2006).

1.2 Palestinian health care system

In Palestine, the health care system is complicated and distinctive which is strongly impacted by the Israeli occupation. The consequences of the closures and separation created a prodigious challenge for the Ministry of Health by making difficulties in the availability to health care services and impacted the harmony of the health care system in all the Palestinian cities (MOH, 2004). There are four key healthcare providers: the Ministry of Health, the UNRWA, the NGOs, and the private sector (non- and for-profit hospitals). The MOH is the key health care provider; it offers primary, secondary, and tertiary care while some services are requested from private suppliers internally and externally. The Palestinians general health is fairly good comparing with other countries of the region. The main eruptions of diseases are prohibited and health indicators also enhanced by operative health services (WHO, 2006).

1.2.1 Organizational structure:

- Medical complex: means hospital that contains more than one hospital with different specializations. In the Gaza governorates there are two medical complexes: Al Shifa and Nasser.
- Big hospitals: means hospital with bed capacity of 101 or over. The big hospitals in the Gaza governorates are: the European Gaza Hospital, Al Aqsa Hospital, Nasser Pediatric Hospital, and the Indonesian Hospital.
- Small hospitals: means hospitals with bed capacity of 100 or less. The small hospitals in the Gaza governorates are: Beit Hanoun Hospital, Al-Najar Hospital, Al-Rantissi Pediatric Hospital, El-Dorra Pediatric Hospital, Al-Helal Al-Emarati Maternity Hospital, Eye Specialist Hospital, and the Psychiatric Hospital.

1.2.2 Specialization:

- **General Hospitals:** these hospitals deliver secondary health care services to their geographical area. Some of these hospitals have adequate capacity to deliver secondary health care and some tertiary health care. In 2016, the number of general hospitals in Palestine reached 43 in which their capacity were 4,455 beds.
- **Specialized Hospitals:** these hospitals deliver specialized, advanced and comprehensive services in secondary and tertiary care. In 2016, there were 21 hospitals in Palestine and thier total capacity were 1,206 beds.
- **Maternity Hospitals:** these hospitals deliver services in the field of obstetrics and gynecology. In 2016, there were 13 hospitals in Palestine included capacity of 296 beds.
- **Rehabilitation & Physiotherapy Centers:** medical centers offering rehabilitation and physiotherapy services. In 2016, there were four centers in Palestine and their total capacity was 189 beds. (MOH.,2017)

1.2.3 Shifa Medical Complex (Shifa Complex)

In 1946, the Shifa Medical Complex, which is the largest in Palestine, was established. It was developed over the years until it reached to over 45,000 square meters which is a higher worldwide level. It is located on the western part of the middle of Gaza City. It consists of three hospitals: surgery, internal medicine and maternity which delivere the health services to the citizens including the different patients referred by reception and emergency departments or clinics by primary care centers who are transferred to internal departments or the hospital outpatients. The total number of the hospital beds is 590 while the total number of its employees is about 1,600 distributed as follows: nursing 36.5%, doctors 35.6%, administrators and technicians in different disciplines 17.7% in which the occupancy rate in the hospital is about 82 %.(MOH, 2017)

1.2.4 European Gaza Hospital (EGH)

This hospital began as a grant of the European Union to the Palestinian people at the end of the first intifada in 1989. At 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, a dialogue was begun to transfer hospital ownership to the Ministry of Health. In October 1997, the ownership of the hospital was transferred to the Ministry of Health.

In July 1999, the international team who was working at the hospital with a local Arab team effectively ended his work in October 2000 and the Arab local team continued management. (MOH,.2017)

1.2.5 Nasser Medical Complex

The foundation stone of the hospital was laid in 1958. It was officially opened in 1960 under the Egyptian administration in the Gaza Strip. Since then, developments in the hospital have taken place in its administrative and medical buildings and technical staff with extensive experience. Initially, the hospital consisted of one floor for the medical departments, in addition to the auxiliary floor for auxiliary services. The capacity of the hospital was 120 beds with four main sections: surgery, dermatology, as well as the existence of a laboratory room and one operating room. After the beginning of 1966, successive years showed new boom in the development of new departments and the expansion of the hospital buildings, especially the external sections.

In addition, the hospital administration has established number of medical centers, outpatient clinics and new buildings that have been assigned to provide quality medical services to the people of the southern region and other areas of the Gaza Strip. (MOH, .2017)

1.2.6 Indonesian Hospital

Indonesian Hospital was opened in the year of 2015 as an extension of Kamal Adwan Hospital, which was established in 2002 in the North Gaza Governorate. It is the major governmental hospital in the North Gaza Governorate.

The total number of beds of Indonesian hospital are 122 and according to annual report (2017), the occupancy rate in the hospital is about 88%.

The total numbers of employees are about 443 divided as follows: Physician 101 (22.8%), Nursing 153 (34.5%), Administrators 124 (28 %), & Support Medical Technicians 65 (14.7%). (MOH,.2017)

1.2.7 Al-Aqsa Martyrs Hospital

Al-Aqsa Martyrs Hospital medical center is the only governmental hospital in the Middle area. It is located in the eastern north of Deir El Balah city. It was established in 2000. Its total numbers of beds are 146 beds & according to annual report (2017) of Al-Aqsa Martyrs Hospital, the occupancy rate in the hospital is about 91%. The total numbers of employees are about 560 divided as follows: physician 150 (26.8%), Nursing 203 (36.3%), Administrators 124 (22.1%), & Support Medical Technicians 83 (14.8%). (MOH, .2017)

1.2.8 Martyr Mohammed Yousef Al-Najjar Hospital

It is located in Rafah city - El Geneina neighborhood. it was the opened in 2000 in an attempt to alleviate the suffering of the people of Rafah and their families at the time of intifada irruption , and was then the Gaza Strip was subject to tight siege and the cutting of his limbs into 4 parts, where the Zionist settlements constituted into approximately 40% of the Gaza Strip and this was making the occupation cut roads through the military checkpoints, and all these pressures have limited the ministry to find a solution to facilitate the provision of health service to the citizens, came to see the Palestinian Ministry of Health Baff Came up many hospitals across the Gaza Strip from the south to the north, and was the martyr Hospital Mohammed Yousef al-Najjar one of these hospitals, and in terms of building the hospital was not prepared as a hospital but was prepared dispensary for primary care, and in light of the severe requirement has been transferred to a hospital serving the Rafah area, which is considered one of the most The densely populated areas, with a population of about 180,000, is the first hospital in Rafah.(MOH.,2012).

1.3 Objectives

1.3.1 General objective of the study

This study aims to assess the governmental hospitals resilience during crises in Gaza governorates (Shifa Medical complex, European Gaza Hospital, Nasser Medical Complex, Al-Aqsa Martyrs hospital, Martyr Mohammed Yousef Al-Najjar, Indonesian Hospital).

1.3.2 Specific objectives

- To assess hospitals safety, vulnerability, crises preparedness and resources management during crises in Gaza governorates.
- To evaluate the continuity of essential services, recovery and adoption during crises among governmental hospitals in Gaza governorates.
- To recognize the challenges facing hospitals resilience during crises in Gaza governorates.
- To identify the differences of hospitals resilience in regard sociodemographic characteristic among governmental hospitals.
- To provide recommendations to the care givers and policy makers to reinforce hospitals resilience during crises.

1.4 Singnification

To the best of our knowledge, there are limited studies about this subject in Gaza governorates hospitals. There is lack of assessment criteria in the Palestinian health system about hospitals resilience in Gaza governorates. Internationally, there are rise incidence, prevalence and morbidity rate of the diseases caused by hospitals inability to absorb shock. This study will help in reducing this problem in Palestine by detection of hospitals risk, and assessment of existing hospitals resilience capability in Gaza governorates. It is expected to decrease the rate of mortality from crises and expected to decrease the cost of service.

1.5 Limitations

The limitations that faced the researcher included:

- Difficulty to reach the decision makers.
- Limited literature and resources.
- Lack of financial resources.

1.6 Overview of Thesis

This study contains mainly five chapters: introduction, literature review, methodology, results and discussion then the conclusion and recommendations.

The first chapter presents general introduction of the study where a brief background of the subject of the study was provided. In this chapter, the researcher shows the research problem, significance of the study, the general goal, the specific objectives and limitation of the study.

The second chapter includes the literature review of the study topic and variables. In-depth detailed theoretical review including previous studies were presented to improve the study.

The third chapter describes the methodology including the study design, population, sample, instruments, pilot study including validity and reliability of study instruments, ethical considerations, and the statistical analysis procedures.

The fourth chapter presents the study results and discussion. The researcher shows the results in form of tables to make it easy for the reader to understand and make comments. Also, the results were discussed in relation to obtainable previous studies that are directly related to the topic of this study and its objectives.

Finally, the researcher presents in the fifth chapter the conclusion, recommendations, and suggestions for further research in the light of the study results.

Chapter 2

Conceptual framework and literature review

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Conceptual framework and literature review

The challenge that researchers face, health leaders and decision makers is how to improve and support the hospitals resilience in a manner that helps governments to improve policy and to empower managers in order to build hospital and organization resilience. So, a conceptual framework is promptly required for key components of hospital resilience identification.

2.1 Conceptual framework

The researcher used conceptual framework adopted from (Zhong et al., 2014) to guide the research progression, organize the work and make the research findings meaningful. The conceptual framework used by the researcher to address the main domains of the study in accordance with previous studies. It includes five factors affect the hospitals resilience which are classified as: hospitals safety and vulnerability, which consists of a number of variables which are hospitals risk and vulnerability, surveillance, organization infrastructure safety. Secondly, hospitals crises preparedness which consists of a number of variables which are: disaster plan, crises communication and community cooperation. Thirdly, resources management which consists of a number of variables which are: resource disaster plan, emergency management and disaster resources. Fourthly, the continuity of essential services, which consists of a number of variables which are: emergency surge capacity, business continuity, emergency medical response and treatment. Finally, the recovery and adaptation that consists of a number of variables which are: healthcare function recovery and healthcare capability assisting community recovery .



Figure (2.1). Self developed model of hospitals disaster resilience.

The first factor is **hospital safety and vulnerability**, which consists of a number of variables which are hospital risk and vulnerability, surveillance, organization infrastructure safety.

The second factor is **hospital crises preparedness**, which consists of a number of variables which are: disaster plan, crises communication and community cooperation.

The third factor is **resources management**, which consists of a number of variables which are: resource disaster plan, emergency management and disaster resources.

The fourth factor is **continuity of essential services**, which consists of a number of variables which are: business continuity, emergency surge capacity, emergency medical response and treatment.

The fifth factor is **recovery and adaptation**, which consists of a number of variables which are: healthcare function recovery and healthcare capability assisting community recovery (Zhong et al., 2014).

2.2 Theoretical definition

Community resilience: *"is defined as the capability (or process) of a community adapting and functioning in the face of disturbance"* (Norris et al., 2008).

Continuity of essential services: *"this is planning process to identify essential personnel, essential functions, key actors and services needed to ensure that business operations can continue"* (UNISDR, 2017).

Crises: *"is the situation of a complex system (family, economy, society) when the system functions poorly, an immediate decision is necessary, but the causes of the dysfunction are not immediately identified"* (Bundy et al., 2017).

Disaster resilience: *"is defined as the capability of a community or society to resist and recover from a disaster"* (Birkmann et al., 2010)

Disaster risk: *"defined as the likelihood that damages will overwhelm the ability of the affected community to respond"* (WHO. 2015).

Disaster: *"is a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts"* (UNISDR, 2017).

Emergency: *"is sometimes used interchangeably with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society"* (UNISDR, 2017).

Hospital resilience: *"is defined as the ability of hospitals to resist, absorb, and respond to the shock of disasters while maintaining and surging essential health services (e.g., on-site rescue, pre-hospital care, emergency medical treatment, critical care, decontamination and isolation), and then to recover to its original state or adapt to a new one"* (Zhong et al., 2014).

Infrastructure resilience: *"it describes the capacity of built infrastructure to continue functioning during disasters. This might include roads, buildings and bridges"* (McDaniels et al., 2008).

Preparedness: *"the knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters"* (UNISDR, 2017).

Reconstruction: *"the medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk"* (Masten et al., 2008).

Recovery: *"the restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk. (Masten, A. S., & Obradovic"* (Masten et al., 2008).

Risk management: *"is defined as the systematic process of identifying, evaluating, and addressing potential and actual risk"* (Singh et al., 2012).

Surge capacity: *"is defined as a health care system's ability to expand quickly to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies"* (UNISDR, 2017).

Vulnerability: *"the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards"* (UNISDR, 2017).

2.3 Literature review

2.3.1 Hospital safety and vulnerability

The World Disaster Reduction Campaign (2008-2009) focuses on "Hospitals Safe from Disasters: reduce risk, protect health facilities, and save lives". In this international effort, world health organization (WHO) is associating with the Secretariat of the UNISDR and the WB to work so that all health facilities stand up to emergencies and remain to function (WHO. 2010).

In disasters, a safe hospital will not breakdown and kill the patients and staff. As a essential community facility, it can stay to work and offer services when it is most wanted, and it is equipped with emergency plans and the health staff trained to preserve the system working. Confirming that hospitals and health facilities are safe from disasters requires strong obligation from the highest political level as well as contribution from all sectors of society (WHO, THE WORLD BANK, ISDR).

El Qadoud Tamer, (2018) conducted a study to measure preparedness of health system for crises and disaster in addition to recognise the features that impacts disasters readiness by using descriptive, cross-sectional design. The sample of the study was purposive. It contained 87 decision makers from nine general hospitals in Gaza Strip. The data collected by the researcher using modified hospital disaster preparedness self-assessment Tool. The results of the study presented that 56.95% of the respondents indicated that security and safety measures are existing in their hospital.

Moreover, Guragin et al ., (2004) conducted a study to assess the structural and non-structural modules against possible earthquakes, the hospitals anticipated performances were assessed then compared with standard risk acceptance matrices. The study results presented that about 80% of the hospitals which were assessed fall in the unacceptable performance level for new construction while 20% of the hospitals are at life safety to failure prevention performance level.

On another direction, there is a study conducted by Golabek-Goldman, M. (2016) to study applied and cost-benefit lessons from the Israeli practice for developing US preparedness of hospital security for a diverse range of mass casualty incidents, both man-made and natural. In the study, 60 interviews were conducted with officials

through Israel's and America's health, defense, and emergency response societies. In the two countries, hospital preparedness is examined and disaster drills were assessed, while a case study was analyzed by San Francisco hospitals. The study results revealed that US hospitals studied in this study had not undertaken animated measures in order to manage the security significances of a large-scale disaster.

2.3.2 Disease surveillance

Surveillance refers to the continuous systematic collection, analysis, and then interpreting of a specific data outcome to be used in planning, executing and assessing public health practices and policies. There are two key purposes of the communicable disease surveillance system which assist in early warning of possible dangers to public health and program observing purposes that could be multi-disease or specific for disease in origin (WHO, 2006)..

The surveillance early warning purposes are essential to all the international health security. The current epidemics, for example, avian influenza, and biological and chemical agent's possible threats, prove the significance of effective national response and surveillance systems (WHO, 2006)..

To identify and comprise public health dangers of local and global significance, the International Health Regulations 2005 highlight the commitment to the goal of global security as well as call on all Member States to establish and apply effective response and surveillance systems. The program observing surveillance of communicable diseases function includes a diversity of objectives, for example, reducing and surveillance for severe flaccid paralysis. Also, the surveillance systems help to observe endemic diseases movements, improve the purposes of disease control, and to deliver information that could be utilized in assessing the impact of disease anticipation and control programs (WHO, 2006). A structured approach to reinforce local communicable disease surveillance systems may include the evaluation of communicable disease dangers to recognize main public health risks. Also, it includes the prioritization of public health risks to confirm that the surveillance is restricted to the significant public health measures. Furthermore, it contains the assessment of present systems to restudy strengths, weaknesses, and opportunities for empowering the systems as well as the improvement of a strategic plan of action built on the

assessment results. In addition to, it includes the execution of planned activities to support the systems. Finally, it includes the monitoring progress in execution of planned activities, the evolution and performance of the surveillance system and then the results evaluation and overall impact of the surveillance system.

Zaboli, R., Seyedin, S., & Malmoon, Z. (2013), conducted a study to conclude the health organization early warning system for disaster in Iran. The study findings are the production of a mixed-methods study. From 2011 to 2012, a sample of 230 health managers was measured by using a questionnaire. The researchers conducted 65 semi-structured interviews with responsible for disaster management including therapeutic affairs and public health managers. The result recognised a variety of problems. Even though, the health organizations have a multi-agency alert system, other early warning system indicators are not acceptable. Moreover, ordinary messages used to aware organizations are not used within the existing system.

2.3.3 Hospital risk

Generally in utmost of the developed countries, the USA particularly, the risk management has become a fundamental part of hospital administration. Nevertheless, in the developing countries the required care to the perception and process of risk management is yet to be given. In the meantime, we are living in a global village and with developed communication technology, patients will file lawsuits against the hospitals and health care workers for medical malpractice and negligence threatening their safety. Hospitals are advised to take into consideration applying and/or empowering their risk management programs in order to reduce financial losses and maintain their resources (Singh, B., & Ghatala, M. H., 2012).

In regard to the fast changes in all aspects of health care industry, there is a necessity to constantly reinforce risk management program evaluation and monitoring.

Singh, B., & Ghatala, M. H., 2012 displays some of the needed parts of reinforcing:

- Ongoing training of key persons and staff.
- Evaluation and monitoring the combined programs.
- Communication with colleagues at organizations with all levels in order to develop the hospital program.

- Discovering circumstances that present chances possible.
- Accessibility of complicated data on previous incidences.
- Recognizing hospital high risk areas.
- Preparing an incident report form to meet the current requirements.
- Demanding the staff to immediately file incident reports after incidents occurrence.
- Reporting nurse and physician associated events.
- Improving and monitoring care quality delivered by physicians and other providers since increasing numbers of claims are holding hospitals accountable for everything that happens within them (hospital properties).
- Enduring support of all hospital community parts.
- Statistical data from external and internal sources.
- Patient representative program categorized by integrity and ability to level with the patient.
- Decrease the level of risk appropriately so that the hospital may assume that risk itself through the less expensive self-insurance.
- Elimination of unnecessarily dangerous processes and given medicines even though safer substitutes may be found.

Ochi et al., (2015) implemented a study shows the necessity of hospital preparedness against disasters to accomplishing health disaster mitigation. In Japan which is one of the greatest disaster-prone countries, a national surveillance of hospital preparedness was implemented. All of the 8701 registered hospitals in Japan were targeted by cross-sectional, paper-based interview. The preparedness was assessed concerning many point related to the local hazards, resources preparation for example water, electricity, transportation tools, communication tools, and compliance to building code. Results revealed that 8% were allocated as disaster-base hospitals while the others were non-disaster-base hospitals. The general compliance to building code was 90%, power generators was 84%, water tanks was 95%, emergency communication tools was 43% and 22% for helicopter platforms.

Moreover, Abeysinghe et al. (2017) made a study following the 2011 Triple Disaster by interviewing medical staff working in Minamisoma city in Japan. It examined the responses of staff to the material resources interruption as a result of the disaster and its

management. The interruption of spaces, oxygen supplies and the loss of food, and medicines compressed upon staff experience and the organisations capability to care for patients. This resulted in a rearrangement of spaces and resources as staff made efforts to re-establish and reconfigure healthcare functions. The study is one of the rare qualitative studies that focuses on health workers experience and perspectives in recognizing material disorder succeeding disaster. This is principally significant as this case excludes the collapse of lifeline infrastructure, but carried out to consider the way everyday material objects form social experience.

Moreover, Pfenninger, E., & Güzelel, H. (2017) conducted a study showed that the, the medical staffs, nursing staff and hospital administration did not pay the essential attention to plans of alarm and evacuation, especially dangers and consequences - including financial ones- because of inadequate planning, are not adequately considered. Based on a risk analysis, risks in hospitals are evaluated whether the danger is acceptable, unacceptable or critical. Risk analysis parameters are the number of affected people and degree of damage. This paper aim to assess whether there is a link between quality of danger planning, assessed danger, and financial damage. He envisaged the risk analysis as a two-dimensional matrix. Also, he presented disaster planning quality as a third dimension and calculated the dependency between planning quality and danger and also between the planning quality and the resulting damage level. He presented that unacceptable risk exponentially is rised by the poor quality of disaster planning. Also conclusions about the degree of financial damage produced can be drew by risk assessment, for example terrorist attacks, fires or infrastructure failure. In hospitals, this generally means the use of an acute event reporting system, yet risk management is mainly unknown in the sense of disaster planning. A three-dimensional risk matrix showed a clear association between the relative risk or financial damage and the quality of disaster planning. However, further research must be designed and applied in order to prove the presented theoretical considerations.

2.3.4 Emergency leadership and cooperation

Cooperation is an essential basis to respond to technological and natural hazards and crises as well as the terrorism consequences.

Since the 1940s and 1950s, the disaster management profession and field increased to more cooperative creativity. This change has progressively moved beyond the administrative model to be more dynamic and flexible network model that eases intergovernmental, multiorganizational, and intersectional cooperation. So far, in Hurricane Katrina and 11th September result, command and control approach was strongly recommended to be used, which is unreliable with the shared power and responsibility that describes the local emergency management system and affect with the cooperation that is essential to deal with man-made and natural risks and manage crises processes.

Modern emergency management offers impossibility. Emergency response needs particular planning and organization, but it is unplanned. Because plans should be invented, adjusted, and created by emergency managers, nevertheless of how well prepared, rarely suitable to the situations. The combination of these contradictory needs is no easy task.

The House Select Committee cited specifically the Leadership problems examined the weak response to Hurricane Katrina. The committee found *“failures at all levels of government that significantly damaged and diminished from the heroic efforts of first responders, private individuals and organizations, faith-based groups, and others”* (William et al., 2006).

Djalali et al. (2012) conducted a study to assess the performance of decision making regarding to Hospital Incident Command System (HICS) actions cards by using tabletop exercises. Between 1st May, 2008 and 31st August, 2009, observational study was implemented and included 23 Iranian hospitals. Based on the highest possible risk, the tabletop exercise used in the study was developed for each hospital. Unbiased performance was < 40% as determined; 41-70% as intermediate; 71-100% as high of the extreme total of 192. T-test, Univariate Analysis of Variance and descriptive statistics were used. The result disclosed that no one of the hospitals participated in the study had a hospital crises management plan. According to HICS, intermediate performance was reported for 83% of the hospitals participated. Moreover, no hospitals reported with high level of performance. The specific part performance level was fair or intermediate, excluding the finance sections and logistic which confirmed a higher

performance level. The university hospitals had lower performances than the public hospitals ($P = 0.04$).

Paganini et al. (2016) implemented a study to describe the Italian hospitals emergency departments' preparedness level by measuring the emergency physicians' knowledge-base concerning basic crises procedure and planning. A longitudinal observational study used a purposeful sample of Emergency Departments of Italian hospitals. They conducted nameless phone interviews with medical consultants who are responsible at the time in the particular ED. They were designed in 3 sections: (1) demographics and general data, (2) the existing crises plan and (3) actions and protocols of the crises plan. 69 ED (81%) agreed to experience the interview out of 85 ED met inclusion criteria. About 45% of participants stated to know what an Emergency Plan for Mass Casualties is, 41% stated that they know who can stimulate the plan, 38% knew who is responsible for intra-hospital processes, while in Part 3 physicians showed a troublesome changeability in critical content knowledge of their answers.

2.3.5 Disaster plans

To be prepared can decrease anxiety, fear, and losses that result from crises and disaster. The individuals, families and communities should have the knowledge of the procedures should be taken in the incident of a fire as well as where to search for shelter during a hurricane. They must be prepared to abandon their houses and move to community shelters and recognize their main medical requirements. Furthermore, the disasters impact could be decreased as well as the danger evaded totally by people.

Every year disasters kill hundreds of thousands. Each crises has long-term effects for belongings and people. If a crises happens in your society, disaster-relief organizations and the local government should work to support you, but you should be prepared. Also, you may be not reached directly as the local responders may not be capable to reach you, or they may focus on somewhere else.

Also, you are advised to be ready to be self-sufficient at least for 3 days by providing your own shelter, water, first aid, food, and sanitation. (FEMA 2004).

Djalali et al., (2014) implemented a study to examine the relationship between the level of response presentation and the level of preparedness during a complete hospital drill.

During a complete drill in a hospital in the Piedmont area of Italy, a pilot study was conducted. Three days before the exercise, a group of three experts conducted the preparedness evaluation, while the response assessment was implemented throughout the drill. The preparedness assessment was done by using the functional capacity module, and the “command and control” function response performance of the hospital was assessed by 9 semi quantitative performance indicators. The results presented that the selected hospital preparedness was 59%, whereas the response performance was assessed as 70%. Besides, the hospital staff conducted Simple Triage and Rapid Transport (START) triage while receiving 61 of the casualties. The yellow group achieved 90% and the green group achieved 100%.

Aladhrai et al., (2015) conducted study to assess the impact of the 2011 Yemeni revolution on hospital crises preparedness in the capital city of Sana’a. The study was executed in September 2011 and 2013. The hospital emergency response list published by the WHO was used for assessment purposes. To conclude the steps taken by hospital authorities to develop hospital preparedness, additional information was also obtained for level of preparedness. However, the results revealed that 7 hospitals were rated “unacceptable” while 4 were rated as “insufficient,” getting a WHO list rating of 10 to 98. 5 hospitals were rated as “unacceptable,” at the second assessment, 3 as “insufficient,” and 1 as “effective,” getting a rating of 9 to 134.

Al-Shareef et al., (2017) conducted a study to assess hospitals crises plans in Makkah city where a questionnaire survey to 17 hospitals was prepared. Data were analysed and organized on hospital characteristics and 3 main domains of disaster plans (general assessment of disaster planning, hospitals structural feasibility, and training and knowledge of the health care worker). A response rate accomplished was 82% (n=14). 4 were private hospitals and 10 (71%) of the hospitals were government hospitals. 11 (79%) hospitals had a capacity of less than 300 beds. Within the previous two years, only 9 (64%) hospitals revised their crises plan and 9 (64%) of the respondents reported that they trained for crises at least twice a year. The study results reported that most of hospitals did not rely on a hazard vulnerability analysis (HVA) to develop their Emergency Operations Plan. 11 (79%) hospitals had the (HICS) in their plans. All hospitals defined obtainability of some materials required for the crises first day response, for example: nerve agents antidotes, N95 masks, and antiviral medications. 5

(36%) of the hospitals only had a designated decontamination area. 9 (64%) hospitals stated their ability to turn inpatient wards into an intensive care unit (ICU) format. 7 (50%) respondents only had a protocol for increasing availability of isolation rooms to prevent the spread of airborne infection. Finally, 10 (71%) hospitals had a selected disaster-training program for health care worker.

2.3.6 Disaster stockpiles and logistics management

At any national emergency response plan, logistics should be an active component, as well as the individual plans of disaster response organizations and main institutions such as health establishments and schools. Logistics must be closely connected to all other functioning activities in the context of responding to a certain emergency. (PAHO, WHO, 2001)

The effective logistical system has two vital components of planning and anticipation. The plan must be founded on a respectable understanding of the area where the operations are to be implemented including its geographical, social, political and physical characteristics. It is not a must to be well thought out in advance in order to be run easily. But, it must be obviously understood and recognized by all stakeholders in any upcoming relief process. The plan must offer perfect answers to the following questions:

- Which tasks must be executed? How do they connect to all the other activities, and what are the right arrangements for executing them?
- Who will be accountable for carrying out such tasks? (Rather than individuals, what must be recognized here are organizations or departments)
- Who will be in responsible for the overall organization of the logistical system?
- What resources are required? How, when, and where can they be obtained?
- What alternative arrangements can be executed if the system is somehow disturbed?

Charney et al., (2013) in their study disseminated a survey to adult patients or family members at 3 emergency departments (EDs) to conclude the public expectations of the hospital in crises concerning resource provision. The respondents were requested to assess hospital duty to offer 9 resources to those without emergency medical needs,

with replacement vaccination or medication refill, water and food. Respondents agreed or strongly agreed that the hospital should offer the succeeding services: (84%) event-specific vaccination, (76.5%) medication refill/replacement, (61%) water and food, (53%) grief or stress counselling, (52%) FEMA access assistance, (51%) short-term shelter, (50%) family reunification, (38%) long-term shelter, and (29%) hospital transportation.

Ford, H., von Waldner, T., & Perri III, M. (2014) in their study they describe the pharmacists roles they have presumed in crises and explain their types and crises that may be fewer well-documented in the literature of pharmacy. The study studies how stable or similarly proportioned role categories are in the literature of pharmacy, whether pharmacy journals vary in the proportion of role categories stated, and whether journals meaningfully vary in the proportion of stated biological, chemical, nuclear (CBRN), radiological, and natural crises. Chi-square analyses disclose important differences in the roles weighted counts, roles journal categorized, and CBRN crises journal categorized.

Fox, E. R., Sweet, B. V., & Jensen, V. (2014), illustrate that crises may cause increase in the demand on drug that lead to drugs shortage, the drug in supply shortage is the product managed by injection. Pain medications, anesthesia medications, antibiotics, nutrition and electrolyte products, and chemotherapy agents are the most common drugs affected by shortages.

Pan, Z. X., & Pokharel, S. (2007) conducted a study to examine the activities of the logistics in Singapore hospitals. The study describes the logistics division several types of activities they done and using information and communication technologies for logistics objectives. The study utilized a framework for data collection, pre-tested the questionnaire and conducted interviews. This study discovers that logistics division perform many connected activities as well as some of them also deliver engineering services. The hospitals use information and communication technologies. The hospitals are gathered under many clusters to lessen the cost of the operation, including the cost related to the logistics. Nevertheless, hospitals do not see associations with suppliers as a considered choice; somewhat they emphasis on logistics services outsourcing.

2.3.7 Emergency trainings and drills

Emergency exercises are defined as the activities implemented to do, improve, examine and develop the plans as well as the hospital or health facility measures to respond to emergencies.

Emergency exercises are executed to evaluate the effectiveness of the emergency response plan of the hospital. The team of exercise planning could be part of a bigger emergency management committee that is accountable for all the hospital response activities and emergency preparedness. Furthermore, the emergency management program manager heads the emergency management committee. (WHO, THEWORLD BANK, ISDR 2010)

The implementation of the exercises is often done as standards for accreditation require. Though, emergency exercises should be implemented regularly as required in order to have all the staff updated with the emergency response.

Sauer et al., (2014) implemented a study to assess the experience of nongovernmental volunteer organizations with spontaneous volunteers during crises and how they were included into the organisation infrastructure as well as their supposed value to previous responses, and responsibility issues related to their use. The researcher contacted 51 national voluntary organizations active in crises organizations for surveys, 24 (47%) of them agreed to participate, 19 (72%) had encountered spontaneous volunteers during a response, (79%) used them regularly, and 68% thought that spontaneous volunteers were usually valuable. 2 organizations always credentialed the spontaneous volunteers, and sometimes 6 (31%). One organization always performed background checks; 53% provided just-in-time training for spontaneous volunteers; 26% conducted evaluations of spontaneous volunteer's performance; while 21% offered health or workers compensation benefits. 2 organizations reported a spontaneous volunteer's death; 42% stated injuries and 32% accepted legal liability for the actions of spontaneous volunteers.

Dewar et al., (2014) conducted a study to examine critical hospital pandemic influenza preparedness in Victoria, Australia, mainly focusing on management and planning efforts. From July to October 2011, the prospective study included questionnaire and semi-structured interview with health managers through the Victorian hospital system.

Participants were nominated from Victoria hospitals with an emergency department to fill out a questionnaire with responsibility for emergency management, operations and planning (response rate 22/43 = 51%). Each one of the respondents was requested to contribute in a cal-based semi-structured interview (response rate 11/22 = 50%). The result discussed that regional/rural hospitals proved higher levels of clinical (86%) and non-clinical (86%) staff emergency planning than metropolitan hospitals (60% and 40% respectively). In exercises or trainings, the pandemic plans were adequately examined which is probably to weaken their effectiveness. All of the respondents stated hand hygiene and standard precautions programs in place, while only one-third (33%) of metropolitan respondents and no regional/rural respondents stated their ability to meet patient needs while the staff absence. Nearly half of the healthcare workers of Victoria's were unvaccinated against influenza.

2.3.8 Emergency surge capacity

Surge capacity is defined as the capability of a health care systems to increase rapidly and meet an increased request for medical care in the incident of large-scale public health emergencies or bioterrorism. The disaster events make a difference between the supply and demand for resources, so surge capacity planning is a way for hospitals to distribute increased requisite for medical care. Effective surge capacity needs the coordination of multiple resources, including supplies, physical structure, equipment, beds, and staff. Furthermore, it depends on hospital policies coordination to rally staff and, other outside organisations in some cases. Possibly the most significant section of surge capacity is staffing which includes public health professionals, nurses, physicians, emergency medical technicians, and mental health staff (Larry et al., 2007).

Hospitals have particular standards for surge capacity staffing which was founded by the Federal Health Resources and Services Administration and applied at the state level. Exactly, a response system should be formed by the states and must allows for: treatment, triage, and disposition of 500 adult and pediatric patients per 1 million population suffering from severe illness or trauma that need hospitalization from a chemical, biological, radiological, or explosive terrorist accident. Also, instant distribution of 250 or more additional patient care personnel per million in urban areas as well as the distribution of 125 or more extra patient care personnel per million in rural areas.

Kandel, N. (2015) conducted a study illustrates that during emergencies, the health system will be stunned and challenged by many issues like staff absence and other inadequate resources. Since the start of the Ebola outbreak, more than half of the workforce in Liberia has been out of work. Continuing the essential services is vital like emergency care, maternal and child health care, and others while responding to emergencies like an Ebola outbreak other pandemic or disaster. To contribute in providing vital services to the public, a business continuity plan (BCP) should be obtained, many sectors during planning should be involved as well as implementing the plan during a crises. An established BCP will not only assist the continuity of services, it also helps in preserving sustainable development achievements. This applies to all sectors other than health, for instance, communication, energy sectors, education, transportation, production and agriculture.

Gist et al., (2016) demonstrate a study to conclude how volunteers may be used in hospital-based crises by their contribution in a full-scale exercise. A "Disaster Olympics" was designed as a full-scale exercise. The Emergency Medicine residents were separated into teams who required to complete one of five challenges as following: mass casualty/decontamination tent assembly, victim decontamination, point of distribution site set-up and operation, patient triage and registration during a disaster, and infection control management. A surge of patients potentially subjected to avian influenza which was the scenario formed for the three challenges. Some volunteers were allocated clinical roles contained within serving as members of the support team for victim decontamination, dispensing medications at the point of distribution, and handling infection control. Other volunteers worked as "victim evaluators" who represented the potential avian influenza victims while simultaneously assessing numerous aspects of the disaster response. The volunteers delivered their feedback on their experience as well as evaluators provided feedback on the performance of the volunteers by means of evaluation tools. Finally, the result shows 28 (90%) volunteers stated that they worked well with both hospital staff and the residents and they expressed that they felt that the exercise was beneficial, and were given clear roles. Yet, 21 (67%) only stated that their qualifications were evaluated before the role assignment. For the "victim evaluators", 9 recognised errors in disaster response and the care aspects they received. Of those who evaluated, 9 (90%) felt that the volunteer worked in a good

way with the hospital staff and residents. 10 (100%) of these evaluators recommended the participation of the volunteers in future disaster exercises.

2.3.9 Emergency response procedures

During crises, hospitals have an essential role within the health care system as they provide important medical care to their societies. Any event that result in loss of infrastructure or patient surge, such as terrorist act, natural disaster, biological, or chemical, radiological, nuclear, or explosive hazard, often require a recovery effort and multifunctional response, which must contain the health care provision. Local health systems could simply become overwhelmed in trying to deliver care throughout an acute incident without suitable emergency planning. The disruption of communication and supply lines, the limited resources and a surge in request for medical services make important fence to the health care provision. Hospitals require to be ready to initiate fundamental priority action in order to improve the health facilities readiness to cope with the disaster challenges, hospitals are complex and possibly vulnerable organisations, reliant on external supply and support lines. Also, with the present stress on cost-containment and efficiency, hospitals regularly work at near capacity. Through a crises, an interruption of standard communications, supply delivery, or external provision services can interrupt vital hospital procedures and even uncertain and unexpected rise in admission volume can overwhelm a hospital beyond its functional reserve. Access to required care and occupational safety can be declined by the employee attrition and shortage of serious equipment and supplies. Coping with the consequences of the disaster is a multifaceted challenge even for a well-prepared hospital. Amid these demands and challenges, the systematic priority actions implementation can assist in facilitate a timely and effective hospital-based response. (Sorensen et al., 2013).

World Health Organization built a tool to assist hospitals with pandemic management according to 9 key components, each with a list of important actions. Hospitals go through an extreme request for health services because of an acute occasion are powerfully stimulated to stay ready to carry out each action efficiently and immediately when it is needed. Each component list contains selected tools, guidelines and other resources which are considered related for that component. Hospital emergency management is a non-stop process necessitating the constant mixing of response and

planning efforts with national and local programs. The recommendations and principles outlined in this tool are generic, applicable to a variety of possibilities and based on an all-hazards approach (WHO, 2011).

Aaserud, M., Trommald, M., & Boynton, J. (2001) demonstrate a study to assess the extent emergency admissions interrupt elective surgical activities, causing lessening competency and less elective measures. They systematically searched for studies published and dealt with the above stated subjects. The result displayed that approximately 10-17% of elective surgical operations are cancelled. In a Norwegian study, about 14% of cancellations appear to be a result of emergency admissions interference.

Durand, V. M. (1983) executed a study to analysis a staff motivation program aimed to decline absenteeism. The unit staff at an organisation for the retarded who were not absent for a complete month could earn 8 hours of supervisor-scheduled leave. The results presented a reduction in staff absence under the incentive program. Also noticed a significant positive association between absence and resident troublemaking behaviour. Residents' troublemaking reduced during the incentive program. These results were preserved at a one year follow-up.

Korlén et al., (2017) performed a study to explore the strategies used by the managers as intermediaries between financial motivations and the individual motivation of staff viewing that managers practiced arrangement strategies to make the inducement model encouraging for staff. The researcher implemented an exploratory qualitative case study of a patient-choice reform, including financial incentives, in particular orthopedics in Sweden. 17 interviews were conducted with professionals in managerial positions who represented 6 healthcare providers. To analyse the data, a hypo-deductive, thematic approach was used. The results display that managers applied arrangement strategies to make the incentive model motivating for staff. The managers' strategies are considered by efforts to arrange outside rewards with professional values based on their practical and contextual knowledge. Managers infrequently overruled the financial logic of the model to protect patient requirements and stated an interest in having a closer dialogue about developments with policy makers.

2.3.10 Hospital medical treatment

Local efforts for preparedness for the management of mass casualty, whether terrorist stimulated, otherwise man-made, or minor to a natural phenomenon, concentrated on the use of health care facilities or hospitals for the placement of the majority of patients produced by such events. The traditional disaster planning has mainly focussed on “fixed occurrence” actions, such as those made by transportation accidents where there are a limited number of victims necessitating hospitalization. The 2001 “mass assassination” terrorist attacks, the risk from developing infectious diseases, or the terrorists who threaten large populations with unusual weapons, containing the use of bioterrorist agents, all make the crucial necessity for societies to increase current competences. Societies must generate solutions that efficiently spread the ability to provide continuous medical care in the face of an extended, longer-term incident. A crises faced by hospitals in Hong Kong and Toronto cities is recent example of this as they resisted with their management of severe respiratory syndrome and the consequence this transmissible developing infectious disease had on the health care delivery systems of these cities. The ability to provide for “surge capacity” must be continued into the complete preparedness, the common idiom used to define the need for staffing and generating additional beds used for patient evaluation, diagnosis, monitoring, and treatment. “Capacity” refers to a measure of the ability to absorb the increase in number of patients. This meaning does not essentially suggest the existence of “demand over time”. It also does not specifically suggest “capability”, which proposes the availability of specialty medical care provision, such as trauma, burn, pediatric, or intensive care, for example. The community planners should decide ahead of time the degree of available medical capability in a crises environment as they are responsible for the delivery of health and medical services. (Hanfling, D., 2006).

2.3.11 Recovery capability

The crises recovery plan is intended to approve the determination of energetic business processes in the occasion that a crises occurs to provide actual solution that can be used to recover all energetic business processes within the needed time frame using energetic records that are kept off-site.

The crises recovery plan provides a state of willingness permitting quick personnel response after the occurrence of a crisis which provides more actual and efficient recovery effort. The crises recovery plan should be established to bound the degree of any loss by lessening the period of a serious application service interruption, evaluate damage, repair the damage, and galvanise the repaired computer centre, recover data and information imperative to the operation of acute applications, manage the recovery operation in an systematized and effective manner and formulate technology personnel to respond efficiently in crises recovery situations (Martin, B. C., 2002).

Motamedi et al., (2009) conducted a study to evaluate what should be done, and what was done to overcome these inadequacies in future disaster. A surveying review of the numerous aspects of management associated to the Bam disaster was implemented by multi-centre studies, the assessment of files, governmental data, and available literature from 2003–200. A review of the available data related to search and rescue (S&R) operations and short-term aid provision exposed flaws in unlike aspects of disaster management including the transfer of the injured, personnel, availability of facilities, treatment planning, equipment transferring, availability of medical supplies, problems concerning the composition of treatment forces dispatched to the region, tasks distribution among treatment staff, and lack of coordination among the organizations accountable for the disaster management. Most of the above-mentioned issues have been addressed.

Khankeh et al., (2013) performed a study founded on qualitative analysis to explore the process of disaster-related rehabilitation. Participants included 18 individuals with experience in receiving or delivering disaster health care or services and selected by using focussed sampling. The while data were collected by recorded in-depth and semi-structured interviews. A content analysis was achieved founded on qualitative content analysis. The study discovered 3 key recovery and rehabilitation concepts after a disaster: the first needs for health recovery; the second determined to delegate responsibility; and the third need for social support. The participants presented that to deliver complete recovery services, significant basic requirements should be taken into consideration including the need for social and physical rehabilitation, livelihood health; the need for mental health care; and the need for family re-unification services.

Moreover, offering social motivation can support the reintegration of the affected people into the community.

Burkle et al., (2012) implemented a study showed that surgical experiences have not formed a suitable standardized collection of reporting and data to meet national authorities and World Health Organization standards using the 2011 International Data Collection guidelines for surgery introduced by Médecins Sans Frontières. The researchers established an individual patient-centric form and an International Standard Reporting Template for Surgical Care to record data for disaster victims and the co-existing load of surgical disease within the community that affected. The data contains perioperative mortality and surgical patient outcomes, accompanied by rehabilitation referrals, psychosocial care and mental health. The standard data format target is to: (first) approve that all surgical providers from medical teams, particularly from local first responder teams and others carrying out emergency surgery, contribute determined and related reporting; (second) deliver generally acceptable forms that meet the least national authorities and the Health Cluster needs; (third) to increase responsibility and transparency that contribute to better humanitarian harmonisation; and (fourth) to ease a complete review of the delivered services to the people affected by the crises.

2.3.12 Disaster recovery and adaptation

Aftermath of disasters the societies have the possibility to adapt successfully and work efficiently. Drawing upon literatures in numerous corrections, they introduced a theory of resilience that includes modern identifications of adaptation, wellness, stress and resource dynamics. Society resilience is the process of connecting a network of adaptive capacities to adaptation after a problem or suffering. Society adaptation is obvious in wellness of the population which is defined as high and non-disparate levels of mental and behavioral health, functioning, and life quality while society resilience arises from 4 primary sets of: Social Capital, adaptive capacities-Economic Development, Information and Communication, and Community Competence that deliver a strategy for crises readiness. To form collective resilience, societies must reduce risk and resource discriminations, involve local people in mitigation, form structural connections, increase and defend social supports, and plan for not having a plan, which needs flexibility, skills of decision-making, and reliable information sources that function in the face of unknowns. (Norris et al., 2008).

Zukowski, R. S. (2014) performed a study to conclude if there is an association between disaster response and recovery outcomes and the adaptive capacity development. The study used a quantitative cross-sectional survey methodology and current society demographic data to discover the growth of adaptive capacity and its capability to forecast disaster response and recovery outcomes in societies affected by main disaster in 2011. The final sample included a total of 333 communities and regions, providing a 95% confidence interval with a 5% margin of error. The descriptive results offered a baseline assessment of adaptive capacity development at the society level. While governing for other variables, hypothesis testing discovered that community engagement, full-scale drills, pre-incident planning, and use of national frameworks established overall response and recovery performance outcomes.

Cueto et al., (2015) carried out a study showed that during 2010 first academic term, participating action investigation processes were implemented in three societies affected by the 2007 high magnitude earthquake which happened in Chincha province (Ica, Peru). In the process, members of the societies recognised, as main problems, aspects related to the society existence, highlighting the consideration of the most vulnerable segments of children and adolescents in the economic restrictions and problems heightened by the earthquake. Results contain an analysis of the requirements and responses succeeding the earthquake, the leadership and the power relations noticeable in the post disaster context and lastly the society contribution through the reconstruction process. Also, the study suggests some subjects resulted from the analysis which aim to contribute to interventions concentrated on society participation and supporting the local resources in situations of excessive weakness to natural disasters.

2.3.13 Conclusion

From the previous review, the researcher can comment on the previous studies in the following points:

1. All previous studies indicated the importance of having the hospitals safe during the crisis because they found that hospitals have low degree of safety and increase the vulnerability (El Qadoud Tamer, 2018) (Guragain, R., & Dixit, A. M., 2004)

2. Previous studies have highlighted the importance of Collaboration for dealing with both natural and technological hazards and disasters and to have Hospital Incident Command System (Djalali, A. et al, 2012)
3. Most studies showed that logistics should be an active component of any national emergency response plan (Charney, R. Let al, 2013).
4. Most studies emphasized that emergency exercises are activities to practice, develop, test and improve the plans and procedures on how a hospital or health facility will respond to emergencies (WHO, TheWorld Bank, ISDR 2010).
5. Most studies emphasized that effective surge capacity requires the coordination of multiple resources, including beds, supplies, equipment, physical structure, and staff (Larry S. Gage, Christine Capito Burch 2007).
6. Most studies recommended that communities must create solutions that effectively extend the ability to deliver uninterrupted medical care in the face of an extended, longer-term event. (Hanfling, D., 2006).
7. Most studies recommended that disaster recovery plan should be developed to limit the magnitude of any loss by minimizing the duration of a critical service interruption (Martin, B. C., 2002).
8. Most studies recommended that communities should function effectively and adapt successfully in the aftermath of disasters. (Norris, F. H et al., 2008).

Chapter 3

Materials and Methods

Chapter 3

Materials and Methods

This chapter presents the study methodology which includes the study design, period of study, place of study, study population, study sampling and ethical consideration, materials and methods of measurement, as well as measurements description and processing. Moreover, it contains selection criteria, study instrument, piloting, response rate, data collection and analysis process.

3.1 Study design

The design of this study is descriptive analytical cross sectional design, which is suitable to evaluate governmental hospitals resilience in Gaza governorates.

3.2 Period of study

The study was conducted from August 2018 to February 2019. It was started by preparing research proposal, then getting the approval from the university to start the study in August 2018, the approval from Ministry of Health (MOH) to start the data collection, designing the data collection instruments. After conducting a pilot study, the data were collected from October to November 2018 and then analysing the data and writing the research during November and December 2018.

3.3 Place of study

The study was carried out in the six main locations in which MOH response to any crises or disaster events which provide emergency services in Gaza Strip governmental hospitals, include Shifa Medical Complex, European Gaza Hospital, Nasser Medical Complex, Indonesian Hospital, Al-Aqsa Martyrs Hospital and Martyr Mohammed Yousef Al-Najjar Hospital.

3.4 Study population

The population of the study consisted of all key persons who meet the eligibility criteria, in the six main selected hospitals, the total number is 230.

3.5 Sample and sampling

Census population was used to answer the questionnaire which are:

1. The hospital administrators.
2. Heads of emergency departments and intensive care units.
3. The theatre matron.
4. Senior nurse and senior doctors in emergency department and intensive care units.
5. Chief of pharmacists.
6. Heads of security.
7. Heads of transportation.

3.6 Eligibility

3.6.1 Inclusion criteria

The six selected hospitals in Gaza Strip were eligible for selection in this study.

1. European Gaza Hospital.
2. Shifa Medical Complexes.
3. Nasser Medical Complexes.
4. Indonesian Hospital.
5. Al-Aqsa Martyrs Hospital.
6. Martyr Mohammed Yousef Al-Najjar Hospital.

Also, key persons who are classified as governmental employees with experience in decision making in the six selected hospitals were included in the study such as:

1. Nurses.
2. Physicians.
3. Administrators.
4. Pharmacist.

3.6.2 Exclusion Criteria

1. The hospitals that do not have emergency services.
2. The hospitals which provide one specialty as El-Nasser Pediatric Hospital.
3. For the questionnaire: the employees who don't make decision.

3.7 Response rate

Of the 230 key persons who constitute the study population, 210 responded with a response rate of 90.1 %.

Table (3.1): Distribution of respondents according to the hospitals:

Hospital	Number of key person	Number of respondents
EGH	50	47
Al Shifa	45	41
Al Najjar	25	23
Al Indonisi	30	26
Al Aqsa	30	27
Nasser	50	46
Total	230	210

3.8 Instrument

The researcher developed his own tools to evaluate the governmental hospitals resilience, the tool is a questionnaire, which was constructed based on the framework and WHO international guidelines. The questionnaire was distributed after being translated into Arabic to be easily understood by the respondents, including an explanatory letter.

3.9 Self-administered questionnaire

The questionnaire used to assess hospitals resilience consisted of six sections. The first part covered hospital safety and vulnerability analysis, the second part assesses hospital crises preparedness, the third part assesses resources management, the fourth part assess continuity of essential services, the fifth assess the recovery and adoption strategies and the last part identifies challenges that affect hospital resilience.

3.10 Validity and Reliability

3.10.1 Validity of the instrument:

3.10.1.1 Face and content validity:

The questionnaire was submitted to panel of expert persons to evaluate its content and organization (annex6).

3.10.1.2 Construct validity

The table (3.2) evaluate the correlation between each domain of and the total instrument

Table (3.2) Validity for domains

Sn	Phrase	Correlation	Sig.	Sig
1	Hospital safety and vulnerability	0.812	0.001	Sig.
2	Hospital crises preparedness	0.854	0.001	Sig
3	Resources management	0.701	0.001	Sig
4	Continuity of essential services	0.906	0.001	Sig
5	Recovery and adoption	0.864	0.001	Sig
6	Resilience of hospitals during crises	0.812	0.001	Sig

3.10.2 Reliability of the instrument

Table (3.3) showed the Cronbache alpha coefficient for each domain

Table (3.3) Reliability for domains

Sn	Phrase	Alpha
1	Hospital safety and vulnerability	0.849
2	Hospital crises preparedness	0.942
3	Resources management	0.811
4	Continuity of essential services	0.830
5	Recovery and adoption	0.917
6	Resilience of hospitals during crises	0.952

3.11 Pilot Study:

A pilot study was conducted before starting the data collection as a pre-test to point out weaknesses in wording, translation, predict response rate, determine the real time needed to fill the questionnaire and identify areas of vagueness and to test the questionnaire reliability and suitability. A total 10% of participants were chosen randomly from the study target population to conduct the pilot study where many changes were made on the questionnaire after implementing the pilot study, accordingly the pilot sample excluded from the study.

3.12 Ethical considerations

The researcher committed to all ethical consideration required to conduct the research, ethical approval was obtain from Helsinki committee in Gaza (Annex 4), also an official approval was obtained from The Islamic University of Gaza (IUG), (Annex 3). Also an official approval was obtained from the Ministry of Health-Gaza (Annex 5), by the General Directorate of Human Resource Department, then General Hospitals Administrator and Hospitals Directors, finally a consent form will be obtained from the participant.

Chapter 4

Results and Discussion

Chapter 4

Results and Discussion

4.1 Introduction

This chapter explains the results of the data statistical analysis with descriptive analysis that shows the characteristics of the socio-demographic of the study sample and the answers of the study questions. The researcher used statistical tests containing percentages, frequencies, and using one sample t test to analyse the item of questionnaire. The item is positive, means that the respondents agree with their content if the calculated t value is greater than the tabular t value of 1.97 (or the probability value is less than 0.05 and the relative weight is greater than 60. While, the negative result is considered to be negative in the sense that the respondent does not agree with its content if the calculated t value is smaller than the tabular t value of 1.97 (or the probability value is less than 0.05 and the relative weight is less than 60%).

4.2 Socio-demographic characteristics of the study

4.2.1 Distribution of the study participants according to their demographic data

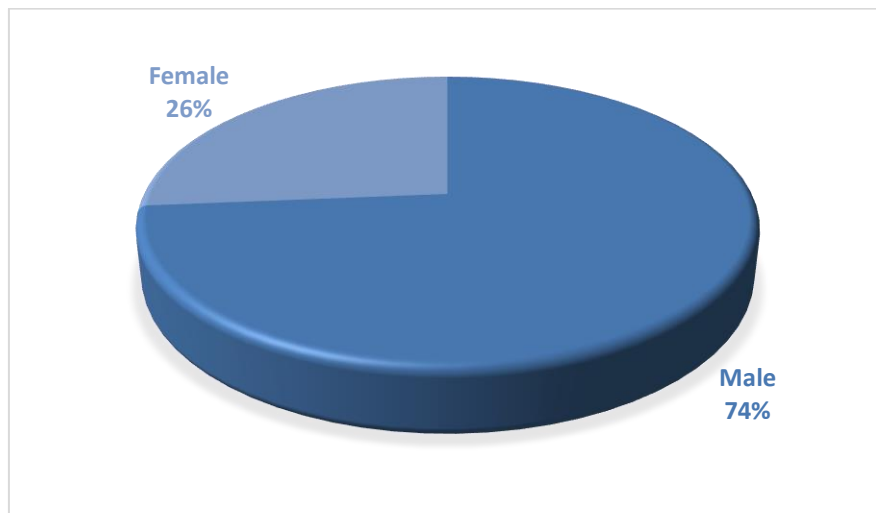


Figure (4.1) Distribution of respondents by gender.

Figure (4.1) shows that 74% of the respondents are males while 26% of the respondents are females.

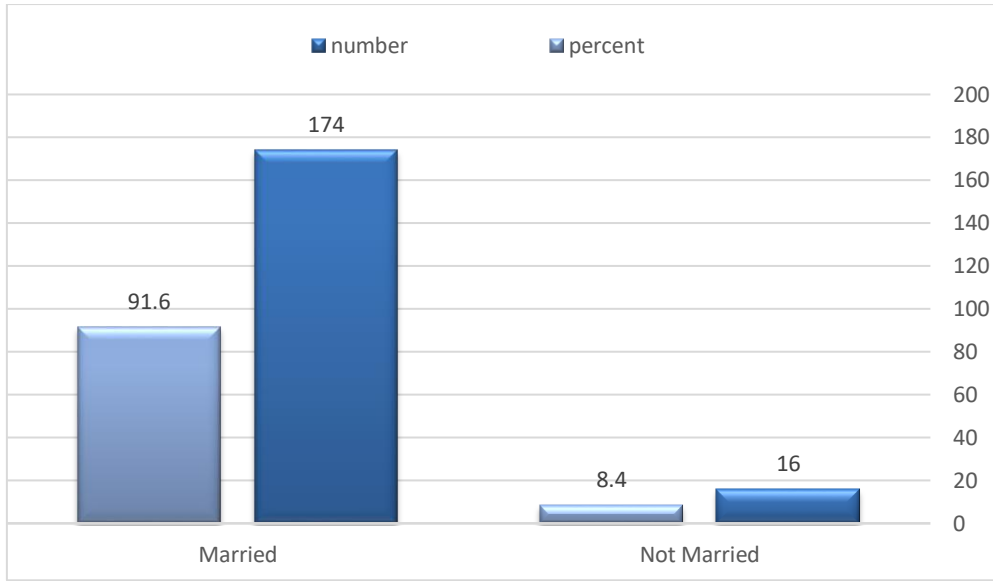


Figure (4.2) Distribution of the respondents by marital status.

Figure (4.2) shows that 91.6% of the respondents are married while 8.4% of the respondents are unmarried.

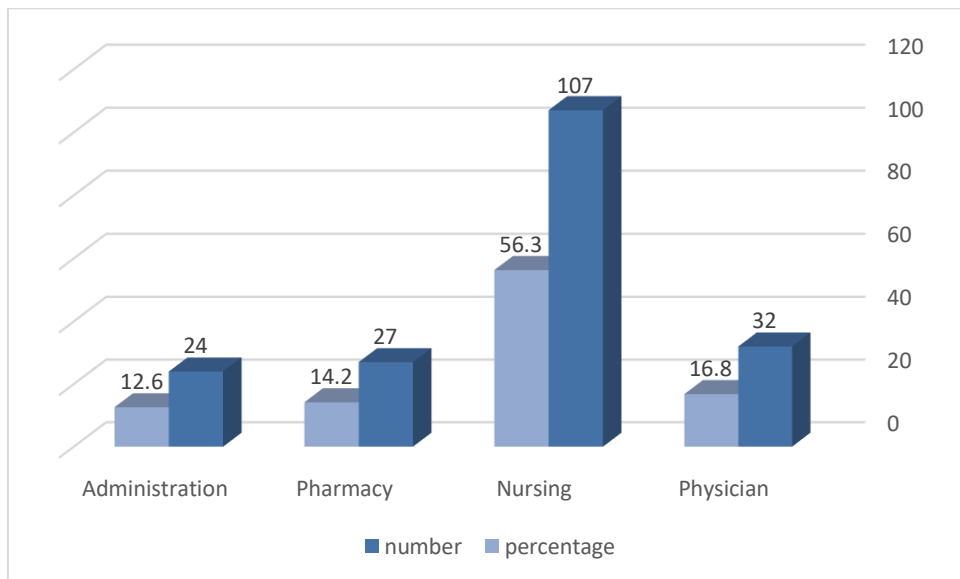


Figure (4.3) Distribution of respondents by Profession.

Figure (4.3) indicates that the highest number of participants were from nursing 107 participants (56.3%), followed by physicians 32 participants (16.8%), then pharmacists 27 participants (14.2%), whereas the lowest number of participants were from administration 24 participants (12.6%).

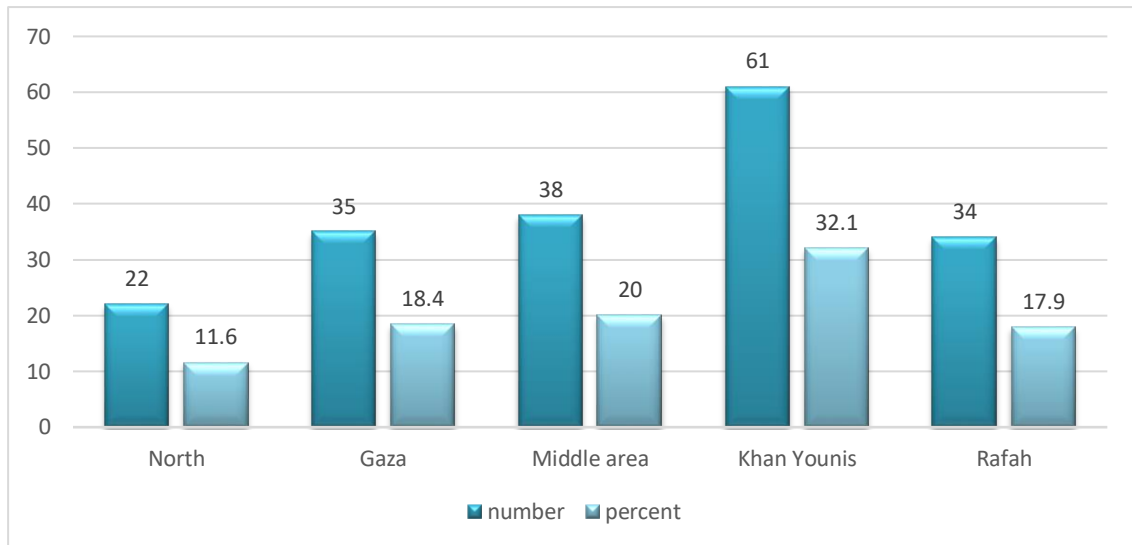


Figure (4.4) Distribution of respondents by Residency.

Figure (4.4) indicates that the highest number of participants were from Khan Younis (61 participants (32.1%)), followed by Middle area (38 participants (20%)), then Gaza (35 participants (18.4%)), then Rafah (34 participants (17.9%)). whereas the lowest number of participants were from North (22 participants (11.6%)).

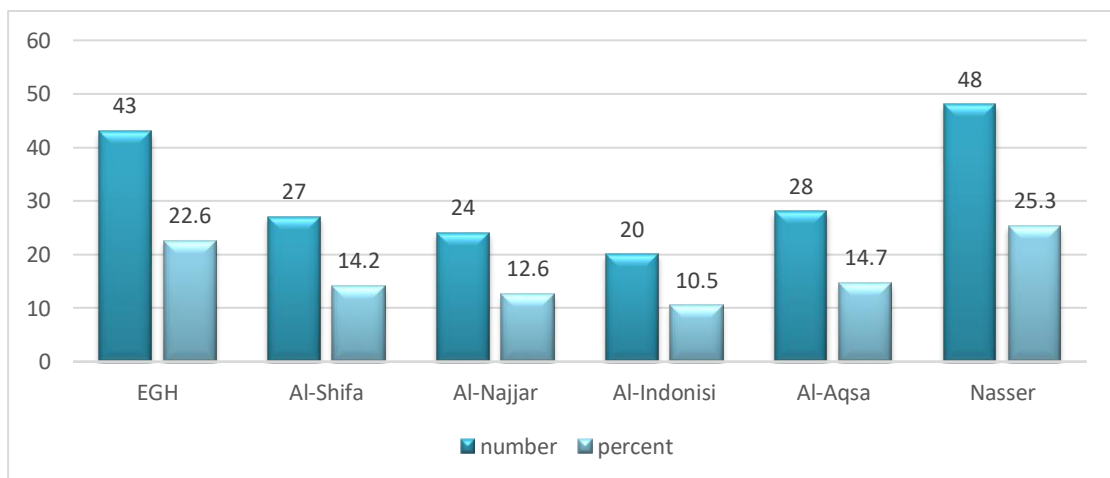


Figure (4.5) Distribution of respondents by Place of work.

Figure (4.5) indicates that the highest number of participants were from Nasser (48 participants (25.3%)), followed by EGH (43 participants (22.6%)), then Al-Aqsa (28 participants (14.7%)), then Al-Shifa (27 participants (14.2%)), then Al-Najjar (24 participants (12.6%)). whereas the lowest number of participants were from Al-Indonisi (20 participants (10.5%)).

Table (4.1) Distribution of the study participants according to their demographic data

Items		Frequency"n"	Percentage%
Age	30 years and less	33	17.4
	From 31 to 40 years	60	31.6
	From 41 to 51 years	65	34.2
	More than 50 years	32	16.8
Educational level	Diploma	18	9.5
	Bachelor	101	53.2
	Master	49	25.8
	PHD	10	5.3
	Board	12	6.3
Years of experience	Less than 5 years	16	8.4
	From 5 to 10 years	47	24.7
	From 11 to 15 years	49	25.8
	More than 15 years	78	41.1

Table 4.1 shows the distribution of participant's characteristics according to their age, educational level and year of experience. Regarding to age, almost 82.6% are older than 30 years. About the educational level, 53.2% of the participants had a bachelor degree (BSC.) while 25.8% hold Master degree which shows that the majority of the key persons are highly educated. About 41.0% of the participants had more than 15 years of experience while 25.8% their experience is between 11 to 15 years.

Table (4.2) Distribution of the study participants according to their response about hospital safety and vulnerability

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	Degree
1	There is an early emergency warning system for the hospital.	2.47	49.40	1.26	-5.803	0.000	8	weak
2	The hospital has a direct reporting system for disease surveillance and emergency events.	2.75	55.00	1.18	-2.888	0.004	5	weak
3	There is evaluation of the safety standards of hospitals infrastructures.	2.84	56.80	1.07	-2.104	0.037	4	weak
4	There is a mechanism to provide the basic resources needed to sustain the work of the hospital (electricity, water, oxygen).	3.47	69.40	1.07	6.088	0.000	1	Strong
5	Financial support is provided to reduce weaknesses.	2.69	53.80	1.10	-3.891	0.000	6	weak
6	Risk and vulnerability are assessed.	3.04	60.80	1.07	0.541	0.589	2	Moderate
7	Risks and risk levels are identified.	2.97	59.40	1.10	-0.396	0.692	3	weak
8	The hospital provides the necessary civilian protection from targeting by enemies or assault by citizens and parents of victims.	2.64	52.80	1.23	-3.999	0.000	7	weak
	Total	2.86	57.18	15.87	47.054	0.000		weak

4.2.2 Distribution of the study participants according to their response about hospital safety and vulnerability

By using one sample t test table 4.2, shows that the weighted mean for hospital safety and vulnerability was 57.18%, and the significant was less than 0.05 which means that participants weakly agreed about hospital safety and vulnerability.

There is a local study conducted by Elqaaoud (2018) which is consistent with our result showed that 56.9% of respondents agreed on hospital safety and vulnerability. It could be because the study conducted in the same area and condition.

In another direction, there is a study implemented by Guragin, R., & Dixit, A. M. (2004) contradicts with our result. It presented that vulnerability assessment is about 80% of hospital fall in unaccepted performance.

About more than tow third of hospital safety and vulnerability item weakly agreed which is low score, so further action should be done by the hospital management to increase the hospital safety and decrease vulnerability.

According to the results, the highest item was “There is a mechanism to provide the basic resources needed to sustain the work of the hospital (electricity, water, oxygen)” with weighted mean 69.4% and significance less than 0.05 which means that participants strongly agreed on this item, followed by “Risk and vulnerability are assessed” with weighted mean 60.8% and significance less than 0.05 which means that participants moderately agreed about this item.

These findings along standing with study reported by Ochi et al., (2015) which showed that over 80% of the hospitals were provided with power generators and more than 90% of the hospitals were provided with water tanks.

Moreover, a study conducted by Abeysinghe et al., (2017) revealed that the disruption in oxygen supplies is a main source of anxiety in continuing the hospital function.

In addition, there is a study carried out by Pfenninger, E., & Güzelel, H. (2017) that is consistent with our result disclosed that a poor quality of crises planning increases the undesirable risk exponentially and risk assessment can also draw assumptions about the extent of the caused financial damage. It is possible to consider the above items as critical infrastructure and it is necessary to provide alternative sources, whether to provide sources of water from more than one source, provide a sufficient number of generators and the provision of fuel needed to operate and provide alternative oxygen generators.

The lowest item was “There is an early emergency warning system for the hospital” with weighted mean 49.4% and significance less than 0.05, which means that participants weakly agreed on this item, followed by “The hospital provides the necessary civilian protection from targeting by enemies or assault by citizens and parents of victims” with weighted mean 52.8% and significance less than 0.05, which means that participants weakly agreed on this item.

These findings were reinforced by a study executed by Zaboli et al., (2013) showed that there is a multi-agency alert system within the health establishments, other early warning system indicators are not acceptable. Besides, the used standard messages to alert establishments are not used under the present system. The response to disasters within the health organizations could be improved by some activities such as memorandum of understanding among different disaster response stakeholders, staff and societies education.

On the other direction, there is a study implemented by Golabek-Goldman, M. (2016) which is consistent with our result. It showed that hospitals didn't have adequate security preparations.

Table (4.3) Distribution of the study participants according to their response about hospital crises preparedness.

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	degree
1	There is crises management committee in the hospital qualified to make decisions efficiently.	3.16	63.20	1.10	2.039	0.043	6	Strong
2	There is a high committee for emergency management in all hospitals.	3.49	69.80	1.02	6.671	0.000	1	Strong
3	There is a general crises plan for public emergency preparedness.	3.38	67.60	1.01	5.200	0.000	2	Strong
4	There is a protocol to initiate the plan, to ensure that the hospital is ready for emergency response immediately.	3.28	65.60	1.07	3.595	0.000	3	Strong
5	There are different levels of response system to deal with different levels and stages of events.	3.19	63.80	1.02	2.624	0.009	5	Strong
6	Crises plans are evaluated and revised annually.	3.06	61.20	1.01	0.865	0.388	8	Strong
7	Emergency plans are deployed and distributed at different administrative levels.	3.24	64.80	1.01	3.321	0.001	4	Strong
8	The hospital implements crises or emergency training programs.	3.13	62.60	1.05	1.722	0.087	7	Strong
9	The hospital implements crises or emergency drills.	3.05	61.00	1.06	0.683	0.496	9	Strong
10	The hospital has a crises training curriculum.	2.88	57.60	1.09	-1.525	0.129	12	weak
11	Hospitalized drills are carried out with all other community emergency facilities.	2.95	59.00	1.03	-0.637	0.525	10	weak
12	There are exercises on crises and disasters every year.	2.85	57.00	1.05	-1.928	0.055	13	weak
13	There is crises training conducted regularly every year.	2.69	53.80	1.08	-3.961	0.000	14	weak
14	There is a hospital evacuation plan if risk isn't controlled.	2.89	57.80	1.19	-1.223	0.223	11	weak
	Total	3.09	61.81	15.97	50.777	0.000		Strong

4.2.3 Distribution of the study participants according to their response about hospital crises preparedness

By using one sample t test table 4.2, it shows that the weighted mean for hospital crises preparedness was 61.81%, and the significant was less than 0.05 which means that participants strongly agreed on the hospital crises preparedness.

There is a study conducted by Djalali et al., (2014), which is consistent with our result, showed that the chosen hospital preparedness score was 36 out of 61 (59%).

On another hand, there is study led by Aladhrai et al., (2015) presented that five hospitals were rated “unacceptable,” three “insufficient”, and one “effective,” for level of preparedness.

This study shows strong significant score 61.81% in hospital disaster preparedness in Gaza Strip governorates. In a disaster-prone country like Palestine, the existing situation demands strong development. Health system authorities must take responsibility for delivering strategic plans, guidelines, standards, and procedures to develop the hospitals disaster preparedness.

According to the results, the highest item was “There is a high committee for emergency management in all hospitals” with weighted mean 69.8% and significance less than 0.05 which means that participants strongly agreed on this item. Followed by item “There is a general crises plan for public emergency preparedness” with weighted mean 67.60 % and significance less than 0.05 which means that participants strongly agreed on this item.

There is a study conducted by Djalali et al., (2012) contradicts with our result which illustrate that no one of the participating hospitals had a hospital disaster plan. Two hospitals only had a selected Hospital Command Centre.

On the other hand, there is a study implemented by Paganini et al., (2016) which is contradict with our result, illustrated that 41 % assumed to know who has the authority to activate the plan, 38 % knew who is responsible for the intra-hospital operations.

Moreover, there is a study executed by Al-Shareef et al., (2017) that is consistent with our result showed that 13 hospital out of 14 have written disaster plan and 79% 11 out of 14 of hospitals have disaster plan committee.

Results demonstrate good knowledge-base of elementary hospital disaster planning concepts. These findings should improve the education of the staff disaster

preparedness, training and follow-up to confirm that these plans are acknowledged to all who are responsible for disaster management capacity and risk reduction.

The lowest item was “There is crises training conducted regularly every year” with weighted mean 53.8% and significance less than 0.05, which means that participants weakly agreed about this item. Followed by the item “There are exercises on crises and disasters every year” with weighted mean 57% and significance less than 0.05, which means that participants weakly agreed about this item.

There is a study conducted by Al-Shareef et al., (2017). Contradict with our result which showed that 29% of hospital have disaster drill Frequency and 64% of hospital review the crises plan frequently. On another hand, there is a study conducted by Alqaaoud 2018 showed that 52.8% of hospital staff have crises training.

Gaza hospitals have experienced several disaster events over the last period. The present research proposes that Gaza hospitals are inadequately prepared for possible disasters which may characterise a significant risk to the health. This study confirmed that there is an important room for development in utmost features of hospital Emergency Operations Plans, specially revising the plan and increasing the frequency of multi-agency and multi-hospital drills. Preparedness for wars applying biologic, chemical, and infectious diseases was established to be sub-optimal and should be evaluated further.

Table (4.4) Distribution of the study participants according to their response about resources management

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	Degree
1	A strategic stock of medicines and medical supplies is available in the hospital.	3.06	61.20	1.10	0.726	0.469	2	Strong
2	There is a strategic stock of different types of emergency item (food and water, stretchers, bleeding cessation kits).	2.85	57.00	1.03	-2.053	0.041	5	low
3	When there is mass casualty incident, the hospital can deliver emergency drugs for on-site rescue.	3.02	60.40	1.04	0.209	0.835	3	Moderate
4	There is a plan to prioritize the distribution of medicines during the crises to ensure the sustainability of the provision of medicines.	3.30	66.00	1.03	4.001	0.000	1	Strong
5	There is signed memorandum of understanding with suppliers to share emergency drugs during emergencies.	2.86	57.20	0.88	-2.312	0.022	4	low
	Total	3.01	60.29	15.37	51.397	0.000		Moderate

4.2.4 Distribution of the study participants according to their response about resources management

By using one sample t test table 4.4, it shows that the weighted mean for resources management was 60.29%, and the significant was less than 0.05 which means that participants moderately agreed on resources management.

These findings along standing with study reported by Charney et al., (2013), about Public perceptions of hospital responsibilities during disaster, respondents strongly agreed that the hospital should provide medication to refill/replacement (76.5%).

Moreover, there is a study implemented by Ford, H., von Waldner, T., & Perri III, M. (2014) which showed that the pharmacists have the ability to perform general health screenings, ensure pharmaceutical resources are appropriately and safely expended, disseminate medical information, triage, ensure appropriate storage conditions of pharmaceutical products, and provide immunizations. .

There is a high public expectation that hospitals will deliver medical and nonmedical disaster relief. To understand these expectations is important to suitable society disaster planning.

According to the results, the highest item was “there is a plan to prioritize the distribution of medicines during the crises to ensure the sustainability of the provision of medicines” with weighted mean 66.0% and significance less than 0.05 which means that participants strongly agreed on this item, followed by “a strategic stock of medicines and medical supplies is available in the hospital” with weighted mean 61.20% and significance less than 0.05 which means that participants strongly agreed about this item.

There is a study conducted by Fox et al., (2014, March) which showed that crises may cause increase the demand on drug that lead to drugs shortage, the drug in short supply is the product managed by injection. The drugs which are most common and affected by shortages include anesthesia medications, pain medications, antibiotics, nutrition and electrolyte products, and chemotherapy agents.

Furthermore, there is a study implemented by Pan, Z. X., & Pokharel, S. (2007) that is consistent with our result showed that utmost hospitals keep a standard level of medicines for two weeks. So, each delivery would refill the amounts to meet demand for two weeks.

The lowest item was “there is a strategic stock of different types of emergency item (food and water, stretchers, bleeding cessation kits)” with weighted mean 57.0% and significance less than 0.05, which means that participants weakly agreed on this item, followed by “there is signed memorandum of Understanding with suppliers to share emergency” with weighted mean 57.20% and significance less than 0.05, which means that participants weakly agreed about this item.

There is a study conducted by Pan, Z. X., & Pokharel, S. (2007) contradicts with our result. It showed that utmost hospitals keep a standard level of different types of emergency item for two weeks, strategic alliance between the hospitals and between the hospitals and suppliers can improve the service levels. Also, the study displays that most hospitals recruit two to three suppliers in order to supply an item, the type of products can differ within a category (for instance, diverse kinds of medicine).

Table (4.5) Distribution of the study participants according to their response about continuity of essential services

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	degree
1	The hospital has the incentive for management of emergency staff.	2.27	45.40	1.06	-9.537	0.000	21	Low
2	An adequate number of beds are provided in the emergency department during crises.	3.09	61.80	3.22	0.406	0.685	16	Low
3	The mechanisms of admission of casualties from accidents are changed according to the high number of injured according to the gravity of each case.	3.30	66.00	1.08	3.834	0.000	10	Strong
4	Flexibility is available to isolate patients as needed.	3.04	60.80	1.09	0.531	0.596	17	Moderate
5	There is flexibility in allocating beds for all specialties according to the type of injuries found in emergency departments.	2.99	59.80	1.10	-0.132	0.895	19	Low
6	There is a plan to increase the intensive care beds according to the needs.	3.24	64.80	1.06	3.159	0.002	11	Strong
7	Whether the hospital has capacity for treating mass casualty of incidents.	3.23	64.60	1.09	2.920	0.004	13	Strong
8	The hospital has capacity for treating mass casualty of infectious diseases.	2.90	58.00	1.08	-1.274	0.204	20	Low
9	When crises occurs, there is internal evaluation mechanism for rapid assessment of the available emergency resources and the disaster losses.	3.13	62.60	1.00	1.810	0.072	15	Strong
10	There are procedures and strategies to evacuate part of the occupied emergency beds for treating the sick and wounded from emergency events according to the requirement.	3.52	70.40	2.99	2.379	0.018	5	Strong
11	The hospital has a wide variety of flexible procedures for surging beds capacity when it faces the emergencies.	3.42	68.40	3.14	1.826	0.069	7	Strong
12	When crises has occur, elective admissions are cancelled.	3.67	73.40	1.00	9.235	0.000	2	Strong

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	degree
13	When crises has occur, early discharge of patients is done.	3.56	71.20	0.99	7.852	0.000	4	Strong
14	When crises has occur, patients transferred to primary health care and other facilities.	3.24	64.80	1.05	3.109	0.002	12	Strong
15	The hospital has a wide variety of flexible procedures for surging emergency staff capacity when facing the emergencies.	3.15	63.00	1.03	1.965	0.051	14	Strong
16	Non-critical care staff are trained and transferred to support critical care.	3.04	60.80	1.06	0.479	0.633	18	Moderate
17	All the off-work staff recalling back to work.	3.38	67.60	1.04	5.019	0.000	8	Strong
18	Volunteers are used during crises.	3.74	74.80	0.98	10.414	0.000	1	Strong
19	There are mass-casualty triage procedures for admission of patients who require urgent critical care during disaster.	3.43	68.60	1.09	5.392	0.000	6	Strong
20	The hospital has its own ambulances.	3.66	73.20	1.10	8.243	0.000	3	Strong
21	There is on-site communication equipment for data transmission.	3.37	67.40	1.09	4.726	0.000	9	Strong
	Total	3.26	65.11	14.60	58.646	0.000		Strong

4.2.5 Distribution of the study participants according to their response about continuity of essential services

By using one sample t test table 4.5, it shows that the weighted mean for Continuity of essential services was 65.1%, and the significant was less than 0.05 which means that participants strangely agreed on this continuity of essential services.

This finding a long standing with study reported by Kandel, N. (2015) which illustrate that having a business steadiness plan and involving many sectors during planning and implementing the plan during a crises will support in providing vital services to the public. Establishing a business continuity plan will not only assist the continuity of services, it also assists in preserving achievements of sustainable development.

On my opinion, continuity of medical services may also be a potential target for future intervention to improve care delivery.

According to the results the highest item was “Volunteers are used during crises” with weighted mean 74.8% and significance less than 0.05 which means that participants strongly agreed about this item, followed by “when crises has occur elective admissions are cancelled” with weighted mean 73.40% and significance less than 0.05 which means that participants strongly agreed about this item.

This finding was reinforced by study led by Sauer et al., (2014) showed that 79% of organization had faced volunteers during their response activities, and 79% of those designated that they had integrated volunteers into their response activities regularly.

Besides, there is study conducted by Gist et al., (2016) that is consistent with our result. It disclosed that 90% volunteers stated that they worked well with the residents and hospital staff, and were given clearly defined roles. Nevertheless, only 67% stated that their experiences were measured prior to role assignment.

On another direction, there is a study conducted by Aaserud et al., (2001) which is consistent with our result showed that approximately 14% of elective surgical operations are cancelled, cancellations seem to be caused by interference from emergency admissions.

Finally, it is worth mentioning that training and drills on disasters should be organized to persons who could be volunteers, to identify roles for volunteers in a hospital during crises.

The lowest item was “The hospital has the incentive for management of emergency staff” with weighted mean 45.4% and significance less than 0.05, which means that participants weakly agreed about this item, followed by “The hospital has capacity for treating mass casualty of infectious diseases” with weighted mean 58% and significance less than 0.05, which means that participants weakly agreed about this item.

There is study conducted by Durand, V. M. (1983) consistent with our result which indicated a reduction in staff absence under the incentive program. It detected also a significant positive correlation between commitment and resident disruptive behaviour. The disruption by the residents reduced during the incentive program.

Additionally, there is a study conducted by Korlén et al., (2017) that is consistent with our result showed that the respondents defined a strategy of marking rewards to make them applicable at the individual level. They thought that rewards should be matched to personal favourites and gave examples of how financial incentives could be rewarding for some individuals, however opportunities for research and competence development were more encouraging for others.

Unlike, there is a study conducted by Dewar, B., Barr, I., & Robinson, P. (2014) that is consistent with our result disclosed that pandemic plans were not being adequately verified in drills or exercises, which is likely to weaken their efficiency.

Table (4.6) Distribution of the study participants according to their response about recovery and adoption

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	Degree
1	The hospital management documents events to take advantage of lessons.	3.48	69.60	1.00	6.595	0.000	1	Strong
2	Hospital management re-evaluates risks and controls them.	3.36	67.20	1.00	4.993	0.000	2	Strong
3	Hospital management determines the vulnerability and challenges encountered.	3.26	65.20	1.04	3.501	0.001	3	Strong
4	The hospital management is developing strategies for adaptation to disaster risk in future plans.	3.18	63.60	0.94	2.689	0.008	4	Strong
5	The hospital management is empowered to rebuild and rehabilitate human and material resources after the disaster and to build back better.	2.96	59.20	1.00	-0.579	0.563	8	Low
6	The hospital administration is working to identify national channels to bring in funds and financial assistance.	3.18	63.60	1.02	2.490	0.014	5	Strong
7	Hospital management relies on specific suppliers to provide supplies for recovery and build back better	3.09	61.80	0.95	1.295	0.197	6	Strong
8	The hospital management is involved in community recovery and promotion of public health after the crises.	2.97	59.40	1.04	-0.348	0.728	7	Low
	Total	3.19	63.74	15.91	52.625	0.000		Strong

4.2.6 Distribution of the study participants according to their response about recovery and adoption

By using one sample t test table 4.6, it shows that the weighted mean for recovery and adoption was 63.74%, and the significant was less than 0.05 which means that participants strongly agreed about recovery and adoption.

This finding is long standing with a study reported by Motamedi et al., (2009) which showed that a complete disaster management plan must not be restricted only to the response phase, but must include: recovery with optimal legislation and budgeting, preparedness, development of healthcare facilities, and prearranged communication channels between the different governmental departments.

Also, there is a study implemented by Khankeh et al., (2013) that is consistent with our result. It illustrated that the study participants specified that to deliver complete recovery services, significant basic requirements should be reflected, containing the requirement for social rehabilitation, physical rehabilitation, and livelihood health.

It is essential to manage survivors continuing health connected difficulties, the vital disaster adoption and recovery goal is to aid the affected people return to a usual life.

According to the results, the highest item was "The hospital management documents events to take advantage of lessons." with weighted mean 69.60% and significance less than 0.05 which means that participants strongly agreed about this item, followed by "Hospital management re-evaluates risks and controls them" with weighted mean 67.20% and significance less than 0.05 which means that participants strongly agreed about this item.

There is a study conducted by Burkle et al., (2012), consistent with our result which showed the surgical experiences have not produced a suitable standardized collection of data and reporting to meet national authorities and World Health Organization standards using the 2011 International Data Collection guidelines for surgery started by Médecins Sans Frontières. The researchers established an individual patient-centric form and an International Standard Reporting Template for Surgical Care to record data for disaster victims and the co-existing load of surgical disease within the community that

affected. The data contains perioperative mortality and surgical patient outcomes, accompanied by rehabilitation referrals, psychosocial care and mental health. The standard data format target is to: (first) approve that all surgical providers from medical teams, particularly from local first responder teams and others carrying out emergency surgery, contribute determined and related reporting; (second) deliver generally acceptable forms that meet the least national authorities and the Health Cluster needs; (third) to increase responsibility and transparency that contribute to better humanitarian harmonisation; and (fourth) to ease a complete review of the delivered services to the people affected by the crises.

The lowest item was "The hospital management is empowered to rebuild and rehabilitate human and material resources after the disaster and to build back better" with weighted mean 59.2% and significance less than 0.05, which means that participants agree weakly about this item, followed by "The hospital management is involved in community recovery and promotion of public health after the crises" with weighted mean 59.40% and significance less than 0.05, which means that participants agree weakly about this item.

There is a study conducted by Zukowski, R. S. (2014) consistent with our result which finds only full-scale exercises were important in improving response and recovery outcome.

On other direction, there is a study conducted by Cueto, R. M., Fernández, M. Z., Moll, S., & Rivera, G. (2015), contradict with our result which showed results contain an analysis of the needs and reactions following the earthquake, the community participation throughout the reconstruction process.

4.2.7 Distribution of the study participants according to their response about resilience of hospitals during crises

Table (4.7) Distribution of the study participants according to their response about resilience of hospitals during crises

Sn	Phrase	Mean	Weight Mean	Std	T	Sig.	Rank	Degree
1	Hospital safety and vulnerability.	2.86	57.18	15.87	-2.44	0.015	5	Low
2	Hospital crises preparedness.	3.09	61.81	15.97	1.564	0.119	3	Strong
3	Resources management.	3.01	60.29	15.37	0.264	0.792	4	Moderate
4	Continuity of essential services.	3.26	65.11	14.60	4.823	0.000	1	Strong
5	Recovery and adoption.	3.19	63.74	15.91	3.238	0.001	2	Strong
	Resilience of hospitals during crises.	3.13	62.53	13.13	2.652	0.009		Strong

By using one sample t test table 4.7 shows that the weighted mean for resilience of hospitals during crises was 62.5%, and the significant was less than 0.05 which means that participants agree strongly about resilience of hospitals during crises.

According to the results the highest domain was “Continuity of essential services” with weighted mean 65.11% and significance less than 0.05 which means that participants agree strongly about this domain, followed by “Recovery and adoption” with weighted mean 63.74% and significance less than 0.05 which means that participants strongly agreed on this domain.

The lowest domain was “Hospital safety and vulnerability” with weighted mean 57.18% and significance less than 0.05, which means that participants agree lowly about this domain, followed by “resources management” with weighted mean 60.29% and significance less than 0.05, which means that participants moderately agreed on this domain.

4.2.8 Distribution of the study participants according to their response about the challenges affect hospital resilience: managerial perspective.

Table (4.8) Distribution of the study participants according to their response about the challenges affect hospital resilience: managerial perspective.

Phrase	%	Rank
Command and control	33.3	1
Human resources	21.7	2
Communication	20.9	3
Post-crises recovery	19.8	4
Surge capacity	18.1	5
Safety and security	15.9	6
Logistics and supply management	15.5	7
Continuity of essential services	13.1	8
Triage	3.7	9

By using multiple response rate analysis table 4.8 shows that command and control is the first resilience challenge 33.3%, followed by Human resources 21.7%, followed by communication 20.9%, while the last one is Triage 3.7%.

4.3.1. Differences between hospital resilience and gender

Table (4.9) Differences between hospital resilience and gender.

Topics	Gender	N	Mean	Std	T	Sig.
Hospital safety and vulnerability	Male	140	57.63	15.66	0.640	0.523
	Female	50	55.95	16.57		
Hospital crises preparedness	Male	140	61.03	16.21	-1.130	0.260
	Female	50	64.00	15.19		
Resources management	Male	140	60.06	15.54	-0.356	0.722
	Female	50	60.96	15.00		
Continuity of essential services	Male	140	65.07	14.69	-0.052	0.959
	Female	50	65.20	14.49		
Recovery and adoption	Male	140	63.18	16.27	-0.809	0.420
	Female	50	65.30	14.90		
Resilience of hospitals during crises	Male	140	62.28	13.16	-0.431	0.667
	Female	50	63.21	13.16		

Table (4.9) shows that there are no statistical differences between hospital resilience and gender as affected by p-value more than 0.05 (sig. > 0.05), this explains that nursing, medical staff work in the same area and tasks showed that there is no difference in the nature of work during crises, therefore there is no difference in their resilience capability related to gender.

4.3.2. Differences between hospital resilience and age

Table (4.10) Differences between hospital resilience and age

Topics	Age	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	30 years and less	33	55.45	19.49	0.219	0.883
	From 31 to 40 years	60	57.67	13.92		
	From 41 to 50 years	65	57.96	15.57		
	More than 51 years	32	56.48	16.41		
	Total	190	57.18	15.87		
Hospital crises preparedness	30 years and less	33	59.35	18.56	0.543	0.653
	From 31 to 40 years	60	61.19	14.41		
	From 41 to 50 years	65	62.53	15.26		
	More than 51 years	32	64.06	17.57		
	Total	190	61.81	15.97		
Resources management	30 years and less	33	57.09	15.92	0.789	0.502
	From 31 to 40 years	60	60.07	17.28		
	From 41 to 51 years	65	60.92	13.49		
	More than 51 years	32	62.75	14.70		
	Total	190	60.29	15.37		
Continuity of essential services	30 years and less	33	63.32	17.89	0.240	0.868
	From 31 to 40 years	60	65.25	12.26		
	From 41 to 51 years	65	65.96	14.94		
	More than 50 years	32	64.94	14.74		
	Total	190	65.11	14.60		
Recovery and adoption	30 years and less	33	59.55	17.49	0.980	0.403
	From 31 to 40 years	60	65.00	14.36		
	From 41 to 51 years	65	64.00	16.19		
	More than 50 years	32	65.16	16.42		
	Total	190	63.74	15.91		
Resilience of hospitals during crises	30 years and less	33	60.11	15.63	0.475	0.700
	From 31 to 40 years	60	62.65	11.66		
	From 41 to 51 years	65	63.23	12.78		
	More than 50 years	32	63.35	13.98		
	Total	190	62.53	13.13		

Table (4.10) shows that there are no statistical differences between hospital resilience and age as affected by p-value more than 0.05 (sig. > 0.05), these is expected result because all health care providers do the best to save patients life in regarding their age.

4.3.3. Differences between hospital resilience and residency

Table (4.11) Differences between hospital resilience and residency

Topics	Residency	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	North	22	56.59	18.17	1.588	0.179
	Gaza	35	56.57	11.36		
	Midzone	38	61.84	14.69		
	Khan Younis	61	53.93	17.18		
	Rafah	34	58.82	16.54		
	Total	190	57.18	15.87		
Hospital crises preparedness	North	22	66.17	17.09	0.921	0.453
	Gaza	35	61.39	13.32		
	Middle area	38	64.02	13.94		
	Khan Younis	61	60.59	17.87		
	Rafah	34	59.16	16.25		
	Total	190	61.81	15.97		
resources management	North	22	60.18	16.86	2.974	0.021
	Gaza	35	62.51	9.26		
	Middle area	38	66.53	14.21		
	Khan Younis	61	57.38	16.46		
	Rafah	34	56.35	16.81		
	Total	190	60.29	15.37		
Continuity of essential services	North	22	63.55	12.10	1.938	0.106
	Gaza	35	69.03	10.19		
	Middle area	38	67.77	10.72		
	Khan Younis	61	64.32	18.37		
	Rafah	34	60.50	15.12		
	Total	190	65.11	14.60		
Recovery and adoption	North	22	63.75	14.28	2.051	0.089
	Gaza	35	66.71	13.90		
	Middle area	38	68.16	13.98		
	Khan Younis	61	59.80	17.47		
	Rafah	34	62.79	16.89		
	Total	190	63.74	15.91		
Resilience of hospitals during crises	North	22	62.94	13.26	1.502	0.203
	Gaza	35	64.43	9.02		
	Middle area	38	65.93	10.82		
	Khan Younis	61	60.64	15.34		
	Rafah	34	59.88	14.21		
	Total	190	62.53	13.13		

Table (4.11) shows that there are no statistical differences between hospital resilience and residency as affected by p-value more than 0.05 (sig. > 0.05), while there is statistical significance differences between resources management and residency. The differences was for Middle area with mean 66.53% followed by Gaza with mean 62.51%(annex 7), The results are expected to be related to the small hospital size in the Middle area, the small number of beds in the hospital, the low number of patients in this area as well as the lack of border conflict zones which the most exposed to events, which lead to decrease medical consumables that are needed.

4.3.4. Differences between hospital resilience and profession

Table (4.12) Differences between hospital resilience and profession

Topics	Profession	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	Physician	32	56.09	18.03	0.444	0.722
	Nursing	107	56.47	16.78		
	Pharmacy	27	59.63	13.44		
	Administration	24	59.06	10.75		
	Total	190	57.18	15.87		
Hospital crises preparedness	Physician	32	65.98	10.09	2.811	0.041
	Nursing	107	58.91	18.41		
	Pharmacy	27	64.87	11.66		
	Administration	24	65.77	12.31		
	Total	190	61.81	15.97		
Resources management	Physician	32	61.38	14.60	2.491	0.062
	Nursing	107	57.83	15.66		
	Pharmacy	27	65.19	15.88		
	Administration	24	64.33	12.75		
	Total	190	60.29	15.37		
Continuity of essential services	Physician	32	67.11	12.99	2.502	0.061
	Nursing	107	62.76	15.28		
	Pharmacy	27	67.13	11.15		
	Administration	24	70.63	15.45		
	Total	190	65.11	14.60		
Recovery and adoption	Physician	32	64.92	14.39	0.146	0.932
	Nursing	107	63.32	17.21		
	Pharmacy	27	62.96	14.56		
	Administration	24	64.90	13.84		
	Total	190	63.74	15.91		
Resilience of hospitals during crises	Physician	32	64.43	10.87	2.017	0.113
	Nursing	107	60.54	14.60		
	Pharmacy	27	64.72	10.41		
	Administration	24	66.38	10.44		
	Total	190	62.53	13.13		

Table (4.12) shows that there are no statistical differences between hospital resilience and profession as affected by p-value more than 0.05 (sig. > 0.05), while there is statistical significance differences between hospital crises preparedness and profession. The differences were for physician with mean 65.98% followed by pharmacy with mean 64.87 % (annex 8).

This result is logically because they do not have a large workload regard to the preparedness compared to nursing staff, as well as nursing ability to understand the preparedness more widely.

4.3.5. Differences between hospital resilience and educational level

Table (4.13) Differences between topics and educational level

Topics	educational level	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	Diploma	18	64.44	10.73	1.491	0.207
	Bachelor	101	55.94	16.08		
	Master	49	55.97	16.59		
	PHD	10	62.75	17.06		
	Board	12	57.08	15.03		
	Total	190	57.18	15.87		
Hospital crises preparedness	Diploma	18	69.84	15.24	1.984	0.099
	Bachelor	101	59.96	16.29		
	Master	49	60.96	17.11		
	PHD	10	68.14	8.49		
	Board	12	63.57	9.66		
	Total	190	61.81	15.97		
resources management	Diploma	18	66.22	11.17	1.194	0.315
	Bachelor	101	58.93	15.76		
	Master	49	60.41	17.05		
	PHD	10	57.60	10.19		
	Board	12	64.67	12.28		
	Total	190	60.29	15.37		
Continuity of essential services	Diploma	18	71.59	12.53	1.445	0.221
	Bachelor	101	63.63	14.61		
	Master	49	64.66	15.95		
	PHD	10	65.24	11.77		
	Board	12	69.52	12.05		
	Total	190	65.11	14.60		
Recovery and adoption	Diploma	18	71.81	7.47	1.600	0.176
	Bachelor	101	62.77	15.28		
	Master	49	61.68	19.14		
	PHD	10	66.00	15.60		
	Board	12	66.25	14.04		
	Total	190	63.74	15.91		
Resilience of hospitals during crises	Diploma	18	69.68	9.02	1.966	0.101
	Bachelor	101	61.07	13.17		
	Master	49	61.69	14.83		
	PHD	10	65.04	10.20		
	Board	12	65.36	9.72		
	Total	190	62.53	13.13		

Table (4.13) shows that there are no statistical differences between hospital resilience and educational level as affected by p-value more than 0.05 (sig. > 0.05).

These results indicate the ability of the staff to work in emergencies efficiently and the teaching and education program demonstrate to staff to strengthen the resilience of hospitals to all categories,

4.3.6. Differences between hospital resilience and years of experience

Table (4.14) Differences between hospital resilience and years of experience

Topics	experience	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	Less than 5 years	16	57.34	17.48	2.607	0.053
	From 5 to 10 years	47	54.26	17.53		
	From 11 to 15 years	49	62.40	12.46		
	More than 15 years	78	55.64	15.93		
	Total	190	57.18	15.87		
Hospital crises preparedness	Less than 5 years	16	62.41	14.72	0.941	0.422
	From 5 to 10 years	47	59.70	16.19		
	From 11 to 15 years	49	64.87	15.76		
	More than 15 years	78	61.04	16.21		
	Total	190	61.81	15.97		
Resources management	Less than 5 years	16	58.75	16.05	1.022	0.384
	From 5 to 10 years	47	57.36	15.36		
	From 11 to 15 years	49	62.53	16.71		
	More than 15 years	78	60.97	14.32		
	Total	190	60.29	15.37		
Continuity of essential services	Less than 5 years	16	62.14	9.05	0.889	0.448
	From 5 to 10 years	47	62.98	16.32		
	From 11 to 15 years	49	67.02	13.55		
	More than 15 years	78	65.80	15.04		
	Total	190	65.11	14.60		
Recovery and adoption	Less than 5 years	16	62.66	12.02	0.604	0.613
	From 5 to 10 years	47	62.77	17.31		
	From 11 to 15 years	49	66.38	15.38		
	More than 15 years	78	62.88	16.15		
	Total	190	63.74	15.91		
resilience of hospitals during crises	Less than 5 years	16	61.29	9.82	1.220	0.304
	From 5 to 10 years	47	60.38	14.32		
	From 11 to 15 years	49	65.33	12.41		
	More than 15 years	78	62.31	13.34		
	Total	190	62.53	13.13		

Table (4.14) shows that there are no statistical differences between hospital resilience and experience as affected by p-value more than 0.05 (sig. > 0.05).

These results indicated the ability of the staff to work in emergencies effectively and the presence of job description, experience and a good knowledge of responsibilities in emergencies and crises situation.

4.3.7. Differences between hospital resilience and hospitals

Table (4.15) Differences between hospital resilience and hospitals

Topics	Hospital	N	Mean	Std	F	Sig.
Hospital safety and vulnerability	EGH	43	54.83	14.72	2.723	0.021
	Al Shifa	27	58.61	10.66		
	Al Najjar	24	64.79	12.53		
	Al Andonisi	20	55.38	18.55		
	Al Aqsa	28	61.79	15.45		
	Nasser	48	52.76	18.26		
Hospital crises preparedness	EGH	43	56.31	13.85	1.651	0.149
	Al Shifa	27	61.22	13.76		
	Al Najjar	24	64.88	10.82		
	Al Andonisi	20	66.43	17.84		
	Al Aqsa	28	63.37	14.72		
	Nasser	48	62.71	19.86		
Resources management	EGH	43	58.33	16.54	2.200	0.056
	Al Shifa	27	64.44	12.95		
	Al Najjar	24	63.83	13.32		
	Al Andonisi	20	59.60	14.21		
	Al Aqsa	28	64.71	14.89		
	Nasser	48	55.67	16.21		
Continuity of essential services	EGH	43	65.23	13.66	2.283	0.048
	Al Shifa	27	69.84	10.22		
	Al Najjar	24	68.49	13.24		
	Al Andonisi	20	62.57	11.60		
	Al Aqsa	28	67.69	11.90		
	Nasser	48	60.20	19.00		
Recovery and adoption	EGH	43	62.91	13.84	2.292	0.047
	Al Shifa	27	67.22	15.63		
	Al Najjar	24	69.69	9.76		
	Al Andonisi	20	62.75	13.64		
	Al Aqsa	28	66.43	14.68		
	Nasser	48	58.39	20.15		
	Total	190	63.74	15.91		
Resilience of hospitals during crises	EGH	43	60.56	11.76	1.883	0.099
	Al Shifa	27	65.22	9.82		
	Al Najjar	24	66.82	10.11		
	Al Andonisi	20	62.27	13.22		
	Al Aqsa	28	65.32	11.92		
	Nasser	48	59.10	16.75		

Table (4.15) shows that there are no statistical differences between hospital resilience and hospitals as affected by p-value more than 0.05 (sig. > 0.05), while there are statistical differences between hospital safety and vulnerability and hospital resilience, the differences for Al Najjar hospital with mean 64.79% followed by al Aqsa hospital 61.79%, because it is small hospitals and the number of beds is low and the absence of some surgical specialties, which lead to transfer of critical cases to other hospitals(annex 9).

Continuity of essential services and hospital resilience the differences for Al Shifa hospital with mean 69.84% followed by Al Najjar hospital with mean 68.49%, Shifa Hospital is one of the largest hospitals which makes the result logical, and can be considered as an indicator of health work in the Gaza Strip, regarding Al Najjar hospital its small hospital with low beds number that make continuity of serves more easier (annex 10).

Regarding, recovery and adoption and hospital resilience the differences for Al Najjar hospital with mean 69.69% followed by Al Shifa hospital with mean 67.22%, these results indicated the presence of well-qualified staff with the ability to deal quickly with crises and to recover the work to the pre-crises(annex 11).

Chapter 5

Conclusions and Recommendations

Chapter 5

Conclusions and Recommendations

5.1 Conclusion

This research wanted to contribute to an enriched hospitals resilience understanding. By evaluating the current state of hospitals resilience, this goal is achieved.

Improving hospitals resilience is crucial in responding to crises and disasters which requires continues planning, accordingly it should be evaluated and monitored by key persons and policy makers to increase health system resilience.

Our results showed moderate level of crises resilience within the governmental hospitals in Gaza Strip with strengthens particularly in continuity of services, recovery and adoption, while weak points existed in safety, security and human resources. Crises can often cause short-term interruptions within the hospitals or they can be long-term.

Also, the study revealed actual fragile cooperation and coordination with other community institutions and agencies such as civil defence, police, municipalities and private sectors. The researcher believes that organized network of coordination and cooperation between these institutions will assist the hospitals in carrying out important functions more competently as well as get better results for the patients.

Our results revealed generally moderate level of hospitals resilience in front of crises. These findings must be taken into consideration as an introductory to additional studies to develop the hospitals resilience level for crises and disastrous occasions.

5.2 Recommendations

- Hospitals must focus more in applying and/or empowering risk management programs to keep their resources and decrease financial losses.
- Improving security perimeter protocols and training, enhancing coordination with law enforcement, and leading more recurrent and realistic lockdown exercises
- Strategic plans and guidelines, standards, and procedures to develop hospital resilience should be delivered by health system authorities who must take responsibility for their delivering.

- The authorities should be alerted by these results in order to improve staff disaster preparedness including their education, training and follow-up to confirm that all who responsible for disaster risk reduction and management capacity area aware of these plans.
- The public has an expectation that they will receive important nonmedical disaster relief by hospitals which is important to suitable community disaster planning.
- Data propose that pharmacists may be ready to react to wars and chemical and biological crises patient management roles and in pharmaceutical supply.
- Hospitals in Gaza Strip should assume some practices such as focusing on local sellers, clustering and outsourcing.
- Information technology should be used by hospitals as viable factors that can develop the service and decrease the operation cost.
- Hospitals should increase the capacity to deal with mass casualties and find more suitable place.
- Primary health care staff should be trained to involve them in the emergency operation plans as they can manage minor cases and decrease the hospitals overwork.

5.3 Suggestions for Further Studies

- To implement a study aim to measure effectiveness of hospital safety on hospital resilience.
- To conduct a study to assess the effectiveness off logistic management on hospital resilience.
- To conducted a study to assess communication gap during crises.
- To carry out a study to measure the hospital ability to deal with infectious disease.

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Appendix

Appendix 1: Hospital Resilience Self-Assessment Tool (Arabic version)

The Islamic University of Gaza
Deanship of Research and Graduate
Studies
Faculty of science
Master of crisis management



الجامعة الإسلامية بغزة
عمادة البحث العلمي والدراسات العليا
كلية العلوم
ماجستير إدارة الأزمات والكوارث

الاستبانة

عزيزي المشارك

يسعدني جدا مشاركتك في هذا البحث العلمي بعنوان تقييم مدى صمود المستشفيات أثناء الأزمات في محافظات قطاع غزة.

هذا البحث متطلب جزئي للحصول على درجة الماجستير في إدارة الأزمات والكوارث من الجامعة الإسلامية كلية الدراسات العليا.

يشير هذا الاستبيان إلي تقييم صمود المستشفيات أثناء الأزمات التي تحدث فجأة، ويمكن أن تسبب تأثير خطير على المجتمع، والتي تتطلب اخذ الاحتياطات والتدابير الواجب اتخاذها. وتشمل هذه الأحداث الكوارث الطبيعية (مثل الزلازل والفيضانات)، حوادث الصحة العامة على سبيل المثال (الأمراض المعدية الناشئة والتسمم الغذائي) وحوادث الأمن العام على سبيل المثال (الحروب والحوادث).

وتهدف هذه الدراسة إلي تقييم قدرة صمود المستشفيات الحكومية أثناء الأزمات في محافظات غزة، وتقييم مدى قدرة صمود المستشفيات وفقا للمعايير الدولية، وتقييم مدى معرفة وتوجهات أصحاب القرار حول قدرة صمود المستشفيات في مواجهة الأزمات.

الوقت الازم لتعبئة الاستبانة هو ١٥ دقيقة، مع العلم ان المشاركة في هذه الاستبانة اختيارية، ولك حق الانسحاب في أي لحظة، جميع المعلومات المقدمة ستستخدم لغرض البحث العلمي فقط مع ضمان السرية التامة، لا داعي لكتابة الاسم على الاستبانة.

يرجى الإجابة على جميع الأسئلة بحسب معرفتك الشخصية أو ما تراه مناسباً، مع العلم أنه لا يوجد آراء صحيحة وأخرى خاطئة، سوف أكون جاهزاً لأي استفسارات أثناء تعبئة الاستبانة.

اثمن عالياً استجابتكم للمشاركة وأشكركم جزيل الشكر.

الباحث/ محمد شعيب الخضري

0599281853

المعلومات الشخصية

المستشفى:	الوظيفة الحالية :	التاريخ: / / ٢٠١٨
الجنس	<input type="checkbox"/> ذكر <input type="checkbox"/> انثى	
العمر سنة	
مكان السكن		
الحالة الاجتماعية	<input type="checkbox"/> أعزب/أنسة <input type="checkbox"/> متزوج/ة <input type="checkbox"/> مطلق/ة <input type="checkbox"/> ارملة	
المهنة	<input type="checkbox"/> طبيب <input type="checkbox"/> حكيم <input type="checkbox"/> صيدلي <input type="checkbox"/> اداري <input type="checkbox"/> أخرى	
آخر شهادة عليمة حصلت عليها	<input type="checkbox"/> دبلوم <input type="checkbox"/> بكالوريوس <input type="checkbox"/> ماجستير <input type="checkbox"/> دكتوراه <input type="checkbox"/> بورد <input type="checkbox"/> أخرى	
سنوات الخبرة	<input type="checkbox"/> أقل من ٥ <input type="checkbox"/> ٥ - ١٠ <input type="checkbox"/> ١١-١٥ <input type="checkbox"/> أكثر من ١٥	

الرجاء تسجيل موافقتك على العبارات التالية بوضع علامة x أمام أحد هذه الخيارات:

١. غير موافق بشدة ٢. غير موافق ٣. محايد ٤. موافق ٥. موافق بشدة

رقم	العبارة	موافقة بشدة	موافقة	محايد	غير موافق	غير موافق بشدة
سلامة بيئة المستشفى ونقاط الضعف						
١	يوجد نظام إنذار مبكر للمستشفى للتبني في حالة الطوارئ.					
٢	يوجد لدى المستشفى نظام إبلاغ مباشر لمراقبة الأمراض والاحداث الطارئة.					
٣	تتوفر معايير لتقييم سلامة البنى التحتية للمستشفى.					
٤	توجد الية لتوفير الموارد الأساسية اللازمة لاستدامة عمل المستشفى(كهرباء ،ماء،اكسجين).					
٥	يتم توفير دعم مالي لتقليل نقاط الضعف.					
٦	يتم تقييم المخاطر وقابلية التعرض للخطر.					
٧	يتم تحديد المخاطر ودرجات الخطورة المتوقعة.					
٨	توفر المستشفى الحماية المدنية اللازمة من الاستهداف من قبل الأعداء أو الاعتداء من قبل المواطنين وأهالي الضحايا.					
جهوزية المستشفيات لمواجهة الأزمات						
٩	يوجد لجنة لإدارة الازمات في المستشفى مؤهلة لاتخاذ القرارات بكفاءة.					
١٠	يوجد لجنة عليا لادارة الطوارئ في كل المستشفيات.					

الرقم	العبارة	موافقة	غير موافقة	محايد	موافق بشدة	موافق
١١	يوجد خطة عامة للأزمات للتأهب لحالات الطوارئ العامة.					
١٢	يتوفر بروتوكول للشروع في تنفيذ الخطة، وذلك لضمان جهوزية المستشفى لمواجهة الطوارئ على الفور.					
١٣	يوجد مستويات مختلفة لنظام الاستجابة للتعامل مع مستويات ومراحل مختلفة من الأحداث.					
١٤	يتم تقييم ومراجعة خطط الأزمات سنويا.					
١٥	يتم نشر وتوزيع خطط الطوارئ على المستويات الإدارية المختلفة.					
١٦	تنفذ المستشفى برامج تدريب على الأزمات أو الطوارئ.					
١٧	تنفذ المستشفى مناورات على الأزمات أو الطوارئ.					
١٨	يتوفر في المستشفى مناهج للتدريب على مواجهة الأزمات.					
١٩	يتم تنفيذ مناورات تشارك المستشفى فيها مع جميع مرافق الطوارئ الأخرى للمجتمع.					
٢٠	يتم عمل مناورات على الأزمات والكوارث كل عام.					
٢١	هناك تدريب على الأزمات بشكل منتظم كل عام.					
٢٢	يوجد خطة إخلاء للمستشفى في حال عدم السيطرة على المخاطر.					
إدارة المصادر والموارد						
٢٣	يتوفر مخزون استراتيجي للأدوية والمستلزمات الطبية داخل المستشفى.					
٢٤	يوجد مخزون احتياطي من أنواع مختلفة من مواد الطوارئ (على سبيل المثال، الغذاء والماء، نقالات، وأدوات وقف النزيف).					
٢٥	عندما يكون هناك حادث إصابات جماعي، يمكن للمستشفى توصيل أدوية الطوارئ من أجل الإنقاذ في الموقع.					
٢٦	توجد خطة لتوزيع الادوية حسب الأولوية خلال الأزمة لضمان استدامة توفر الادوية.					
٢٧	هناك مذكرة تفاهم موقعة مع الموردين لتوريد الأدوية الطارئة أثناء حالات الطوارئ.					
استمرار الخدمات الأساسية						
٢٨	المستشفى لديه استراتيجية الحوافز لإدارة موظفي الطوارئ.					
٢٩	يتم توفير عدد كافي من الاسرة في قسم الطوارئ خلال الأزمات.					

ترتيب	العبارة	شدة	غير موافق	محايد	موافق	موافق بشدة
٣٠	يتم تغيير آليات مبيت المصابين من الحوادث بناء على ارتفاع عدد المصابين وفق درجات خطورة كل حالة.					
٣١	تتوفر مرونة تساهم في عزل المصابين حسب الحاجة.					
٣٢	توجد مرونة في تخصيص أسرة لكافة تخصصات المبيت وفق نوعية الإصابات المتواجدة في أقسام الاستقبال والطوارئ.					
٣٣	يوجد خطة لزيادة أسرة العناية المكثفة وفق احتياجات الحالات المرضية.					
٣٤	لدى المستشفى القدرة على علاج الإصابات الجماعية للحوادث.					
٣٥	المستشفى لديه القدرة لعلاج الضحايا الجماعية للأمراض المعدية.					
٣٦	عند حدوث كارثة، توجد آلية تقييم داخلية للتقييم السريع لموارد الطوارئ المتاحة والخسائر من الكوارث.					
٣٧	هناك إجراءات لإخلاء جزء من أسرة الطوارئ المشغولة لعلاج المرضى والجرحى من الأحداث الطارئة وفقاً للمتطلبات.					
٣٨	لدى المستشفى مجموعة واسعة من الإجراءات المرنة لزيادة سعة الأسرة عندما تواجه حالات الطوارئ.					
٣٩	عند حدوث الأزمات يتم إلغاء الدخول المجدول.					
٤٠	عندما تحدث الأزمة يتم القيام بالخروج المبكر للمرضى.					
٤١	عند حدوث الأزمة يتم نقل المرضى إلى الرعاية الصحية الأولية وغيرها من المرافق.					
٤٢	لدى المستشفى مجموعة واسعة من الإجراءات المرنة لزيادة قدرة الطواقم عند مواجهة الطوارئ.					
٤٣	يتم تدريب ونقل موظفي الرعاية الصحية لدعم الرعاية الحرجة.					
٤٤	يتم استرجاع جميع الموظفين خارج العمل إلى العمل.					
٤٥	يتم الاستعانة بالمتطوعين أثناء الأزمات.					
٤٦	يتم إجراء فرز للعدد الكبير من الإصابات قبل دخول المرضى الذين يحتاجون إلى رعاية حرجة عاجلة خلال الكارثة.					
٤٧	لدى المستشفى سيارات إسعاف خاصة بها.					
٤٨	هناك معدات اتصال في موقع الحدث لنقل البيانات والمعلومات.					

الرقم	العبارة	نشطة	غير موافق	غير موافق	محايد	موافق	نشطة	موافق
إعادة الاعمار والتأهيل								
٤٩	تقوم إدارة المستشفى بتوثيق الأحداث للاستفادة منها في الدروس والعبر.							
٥٠	تعمل إدارة المستشفى على إعادة تقييم المخاطر وآلية السيطرة عليها.							
٥١	تحدد إدارة المستشفى نقاط الضعف والمعوقات التي واجهتها.							
٥٢	تقوم إدارة المستشفى على تطوير استراتيجيات التكيف مع مخاطر الكوارث في الخطط المستقبلية.							
٥٣	تخول إدارة المستشفى جهة مختصة لإعادة البناء والتأهيل للموارد البشرية والمادية بعد الكارثة والبناء بشكل أفضل.							
٥٤	تعمل إدارة المستشفى على تحديد قنوات وطنية لجلب الأموال والمساعدات المالية.							
٥٥	تعتمد إدارة المستشفى جهات محددة لتوريد مستلزمات إعادة التأهيل والبناء بشكل أفضل.							
٥٦	تشارك إدارة المستشفى في إنعاش المجتمع وتعزيز الصحة العامة بعد الازمات.							

٥٧- الرجاء ترتيب التحديات التي تؤثر على صمود المستشفيات حسب الأولوية من الأكثر ثم الأقل، من وجهة نظرك:

- () القيادة والسيطرة
- () التواصل
- () الامن والاسلامة
- () فرز الإصابات
- () القدرة على التدخل السريع
- () استمرار الخدمات الأساسية
- () القوى البشرية
- () إدارة المصادر والمخازن
- () الاستشفاء ما بعد الازمات

Appendix 2: Hospital Resilience Self-Assessment Tool (English version)

The Islamic University of Gaza
Deanship of Research and Graduate
Studies
Faculty of science
Master of crisis management



الجامعة الإسلامية بغزة
عمادة البحث العلمي والدراسات العليا
كلية العلوم
ماجستير إدارة الازمات والكوارث

A questionnaire

Dear participant,

I am very pleased to participate in this scientific research entitled Assessment of the resilience of hospitals during crises in the governorates of the Gaza Strip.

This research is a partial requirement for a master degree in Crises and Disaster Management from the Islamic University -Research and Graduate Studies.

This questionnaire refers to the assessment of the resilience of hospitals during crises that occur suddenly, and can cause a serious impact on society, which requires taking precautions and measures to be taken. These include natural disasters (such as earthquakes and floods), public health incidents (for example, emerging infectious diseases and food poisoning) and public security incidents (wars and accidents).

The aim of this study is to assess the resilience of government hospitals during crises in Gaza governorates, assess the resilience of hospitals in accordance with international standards, and assess the extent of knowledge and attitudes of decision-makers about the resilience of hospitals in facing crises.

The time required to fill out the questionnaire is 15 minutes. Participation in this questionnaire is optional, and you have the right to withdraw at any time. All information provided will be used for the purpose of scientific research only, while ensuring complete confidentiality. No need to write the name on the questionnaire.

Please answer all questions according to your personal knowledge or what you think is appropriate, knowing that there are no valid and incorrect opinions, I will be ready for any questions during filling out the questionnaire.

I highly appreciate your response to the participation and thank you very much.

Researcher/ Mohammed Sh. El-Khodary

0599281853

Personal information

Hospital:	Current job:	Date : ... / ... / 2018
Gender	<input type="checkbox"/> male <input type="checkbox"/> female	
Age years	
Address	
Marital status	<input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed	
Profession	<input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Pharmacist <input type="checkbox"/> Administrative <input type="checkbox"/> Other	
Last Certificate Received	<input type="checkbox"/> Diploma <input type="checkbox"/> Bachelor <input type="checkbox"/> Master <input type="checkbox"/> Doctorate <input type="checkbox"/> Board <input type="checkbox"/> Other	

Please record your acceptance of the following statements by marking x in front of one of options: 1. Strongly disagree 2. Disagree 3. Undecided 4. Agree 5. Strongly agree						
number	Item	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Hospital safety and vulnerability						
1.	There is an early emergency warning system for the hospital.					
2.	The hospital has a direct reporting system for disease surveillance and emergency events.					
3.	There is evaluation of the safety standards of hospital's infrastructures.					
4.	There is a mechanism to provide the basic resources needed to sustain the work of the hospital (electricity, water, oxygen).					
5.	Financial support is provided to reduce weaknesses.					
6.	Risk and vulnerability are assessed.					
7.	Risks and risk levels are identified.					

number	Item	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
8.	The hospital provides the necessary civilian protection from targeting by enemies or assault by citizens and parents of victims.					
Hospital crises preparedness						
9.	There is crises management committee in the hospital qualified to make decisions efficiently.					
10.	There is a high committee for emergency management in all hospitals.					
11.	There is a general crises plan for public emergency preparedness.					
12.	There is a protocol to initiate the plan, to ensure that the hospital is ready for emergency response immediately.					
13.	There are different levels of response system to deal with different levels and stages of events.					
14.	Crises plans are evaluated and revised annually.					
15.	Emergency plans are deployed and distributed at different administrative levels.					
16.	The hospital implements crises or emergency training programs.					
17.	The hospital implements crises or emergency drills.					
18.	The hospital has a crises training curriculum.					
19.	Hospitalized drills are carried out with all other community emergency facilities.					
20.	There are exercises on crises and disasters every year.					
21.	There is crises training conducted regularly every year.					
22.	There is a hospital evacuation plan if risk isn't controlled.					

resources management						
number	Item	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
23.	A strategic stock of medicines and medical supplies is available in the hospital.					
24.	There is a strategic stock of different types of emergency item (food and water, stretchers, bleeding cessation kits).					
25.	When there is mass casualty incident, the hospital can deliver emergency drugs for on-site rescue.					
26.	There is a plan to prioritize the distribution of medicines during the crises to ensure the sustainability of the provision of medicines.					
27.	There is signed Memorandum of Understanding with suppliers to share emergency drugs during emergencies.					
Continuity of essential services						
28.	The hospital has the incentive for management of emergency staff.					
29.	An adequate number of beds are provided in the emergency department during crises					
30.	The mechanisms of admission of casualties from accidents are changed according to the high number of injured according to the gravity of each case.					
31.	Flexibility is available to isolate patients as needed					
32.	There is flexibility in allocating beds for all specialties according to the type of injuries found in emergency departments.					
33.	There is a plan to increase the intensive care beds according to the needs.					

number	Item	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
34.	The hospital has capacity for treating mass casualty of incidents.					
35.	The hospital has capacity for treating mass casualty of infectious diseases					
36.	When crises occurs, there is internal evaluation mechanism for rapid assessment of the available emergency resources and the disaster losses					
37.	There are procedures and strategies to evacuate part of the occupied emergency beds for treating the sick and wounded from emergency events according to the requirement.					
38.	The hospital has a wide variety of flexible procedures for surging beds capacity when it faces the emergencies.					
39.	When crises has occur, elective admissions are cancelled.					
40.	When crises has occur, early discharge of patients is done.					
41.	When crises has occur, patients transferred to primary health care and other facilities.					
42.	The hospital has a wide variety of flexible procedures for surging emergency staff capacity when facing the emergencies.					
43.	Non-critical care staff are trained and transferred to support critical care.					
44.	All the off-work staff recalling back to work.					
45.	Volunteers are used during crises.					
46.	There are mass-casualty triage procedures for admission of patients who require urgent critical care during disaster.					


number	Item	Strongly disagree	Disagree	Unde-cided	Agree	Strongly agree
47.	The hospital has its own ambulances.					
48.	There is on-site communication equipment for data transmission.					
Recovery and adoption						
49.	The hospital management documents events to take advantage of lessons.					
50.	Hospital management re-evaluates risks and controls them.					
51.	Hospital management determines the vulnerability and challenges encountered.					
52.	The hospital management is developing strategies for adaptation to disaster risk in future plans.					
53.	The hospital management is empowered to rebuild and rehabilitate human and material resources after the disaster and to build back better.					
54.	The hospital administration is working to identify national channels to bring in funds and financial assistance.					
55.	Hospital management relies on specific suppliers to provide supplies for recovery and build back better.					
56.	The hospital management is involved in community recovery and promotion of public health after the crises.					

57. Please prioritize the challenges affect hospital resilience from your opinion.

- Command and control
- Communication
- Safety and security
- Triage
- Surge capacity
- Continuity of essential services
- Human resources
- Logistics and supply management
- Post-crisis recovery

Appendix 3: Approval letter from the Islamic University – Gaza

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**الجامعة الإسلامية غزة**
The Islamic University of Gaza

FACULTY OF SCIENCE كلية العلوم


ج س ع/174/64
الرقم: 2018/9/8
التاريخ:

الأخ الغاضل/ د. رامي العبادلة حفظه الله...
مدير عام تنمية القوى البشرية بوزارة الصحة
السلام عليكم ورحمة الله وبركاته،،

الموضوع / تسهيل مهمة

بداية تهديكم عمادة كلية العلوم بالجامعة الإسلامية بغزة أطيب تحياتها، ونرجو من سيادتكم التكرم بتسهيل مهمة الباحث/ محمد شيعب الخضري تخصص ماجستير (إدارة الأزمات والكوارث) في الحصول على المعلومات اللازمة لإتمام رسالة الماجستير، وذلك لغرض البحث العلمي.

شاكرين لكم حسن تعاونكم معنا...

عميد كلية العلوم

أ.د. أسعد يوسف أسعد



- نسخة للفقء -

+97082644400 +97082644800 public@iugaza.edu.ps www.iugaza.edu.ps iugaza iugaza iugaza
ص ب 108 الرمال غزة فلسطين P.O Box 108, Rimal, Gaza, Palestine

Appendix 4: Approval letter from Helsinki Committee

**المجلس الفلسطيني للبحوث 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: 2018/10/08 **Number: PHRC/HC/422/18**

Name: Mohammed Elkhodary الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: **نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:**

Assessment of governmental hospitals resilience during crisis in Gaza
Governorates: Challenges and Implications

The committee has decided to approve the above mentioned research. **وقد قررت الموافقة على البحث المذكور عليه بالرقم والتاريخ المذكوران عليه**
Approval number PHRC/HC/422/18 in its meeting on 2018/10/08

Signature

Member **Member**

Dr. Yehia Abed **د. يهيا عابد**

Chairman **رئيس اللجنة**

Genral Conditions:- **Specific Conditions:-**

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

E-Mail: pal.phrc@gmail.com

Gaza - Palestine **غزة - فلسطين**
شارع النصر - مفترق العيون

Appendix 5: Approval letter from Ministry of Health

State of Palestine
Ministry of health



دولة فلسطين
وزارة الصحة

التاريخ: 23/09/2018
رقم المراسلة 245460

السيد : رامي عيد سليمان العبادله المحترم

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

السلام عليكم ...

الموضوع/ تسهيل مهمة الباحث// محمد شعيب الخضري

التفاصيل //

بخصوص الموضوع أعلاه، يرجى تسهيل مهمة الباحث/ محمد شعيب الخضري
الملتحق ببرنامح ماجستير إدارة الأزمات والكوارث – كلية العلوم- الجامعة الإسلامية بغزة في إجراء بحث بعنوان:-
" تقييم مدى صمود المستشفيات الحكومية في الأزمات في محافظات غزة"
حيث الباحث بحاجة لتعبئة استبانة من عدد من أصحاب القرار في المستشفيات (مجمع الشفاء الطبي –مستشفى الاندونيبي -
مستشفى شهداء الأقصى- مجمع ناصر الطبي – مستشفى غزة الأوربي) ، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث
العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحيه والتقدير،
ملاحظات:

1. تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 5 أشهر من تاريخه.

محمد ابراهيم محمد السراوي

مدير دائرة/الإدارة العامة لتنمية القوى البشرية -



التحويلات

إجراءانكم بالخصوص(23/09/2018)	← رامي عيد سليمان العبادله (مدير عام بالوزارة)	■ محمد ابراهيم محمد السراوي(مدير دائرة)
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Appendix 6: List of experts

Name	Place of work
Dr. Zeyad Abu Hain	The Islamic University – Gaza
Dr. Nezam Al Ashqar	The Islamic University – Gaza
Dr. Hussam Al Najjar	The Islamic University – Gaza
Dr. Azam Abu Habib	UNRWA
Dr. Ahmed Al Shaer	The Islamic University – Gaza
Dr. Motasim Salah	Ministry Of Health
Dr. Abdel Kareem Redwan	The Islamic University – Gaza
Dr. Mohammed Elmogaiar	Civil Defense
Dr. Khalil Shaqfa	Ministry Of Health
Dr. Samer ELnawajha	University College of Applied Sciences

Appendix 7: Post Hoc Tests for resources management and governorates

Multiple Comparisons

Dependent Variable: D.3

Bonferroni

(I) address	(J) address	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
North	Gaza	-2.332-	4.096	1.000	-13.97-	9.30
	Midzone	-6.344-	4.033	1.000	-17.80-	5.11
	Khanyounis	2.805	3.744	1.000	-7.83-	13.44
	Rafah	3.829	4.119	1.000	-7.87-	15.53
Gaza	North	2.332	4.096	1.000	-9.30-	13.97
	Midzone	-4.012-	3.527	1.000	-14.03-	6.01
	Khanyounis	5.137	3.192	1.000	-3.93-	14.21
	Rafah	6.161	3.625	.909	-4.14-	16.46
Midzone	North	6.344	4.033	1.000	-5.11-	17.80
	Gaza	4.012	3.527	1.000	-6.01-	14.03
	Khanyounis	9.149*	3.111	.037	.31	17.99
	Rafah	10.173*	3.554	.047	.08	20.27
Khanyounis	North	-2.805-	3.744	1.000	-13.44-	7.83
	Gaza	-5.137-	3.192	1.000	-14.21-	3.93
	Midzone	-9.149-*	3.111	.037	-17.99-	-.31-
	Rafah	1.024	3.222	1.000	-8.13-	10.18
Rafah	North	-3.829-	4.119	1.000	-15.53-	7.87
	Gaza	-6.161-	3.625	.909	-16.46-	4.14
	Midzone	-10.173-*	3.554	.047	-20.27-	-.08-
	Khanyounis	-1.024-	3.222	1.000	-10.18-	8.13

*. The mean difference is significant at the 0.05 level.

Appendix 8: Post Hoc Tests for Hospital crisis preparedness and profession

Multiple Comparisons

Dependent Variable: D.2

Bonferroni

(I) profession	(J) profession	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	7.077	3.171	.161	-1.38	15.53
	3	1.114	4.113	1.000	-9.85	12.08
	4	.208	4.250	1.000	-11.13	11.54
2	1	-7.077	3.171	.161	-15.53	1.38
	3	-5.963	3.390	.481	-15.00	3.08
	4	-6.869	3.555	.329	-16.35	2.61
3	1	-1.114	4.113	1.000	-12.08	9.85
	2	5.963	3.390	.481	-3.08	15.00
	4	-.906	4.416	1.000	-12.68	10.87
4	1	-.208	4.250	1.000	-11.54	11.13
	2	6.869	3.555	.329	-2.61	16.35
	3	.906	4.416	1.000	-10.87	12.68

Appendix 9: Post Hoc Tests for Hospital safety and vulnerability

Multiple Comparisons

(I) hospital	(J) hospital	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
EGH	Al SHifa	-3.786-	3.812	1.000	-15.12-	7.55
	Al Najjar	-9.966-	3.955	.189	-21.73-	1.80
	AL Andonisi	-.549-	4.201	1.000	-13.04-	11.95
	Al Aqsa	-6.960-	3.770	.997	-18.17-	4.25
	Naser	2.065	3.259	1.000	-7.63-	11.76
Al SHifa	EGH	3.786	3.812	1.000	-7.55-	15.12
	Al Najjar	-6.181-	4.355	1.000	-19.13-	6.77
	AL Andonisi	3.236	4.580	1.000	-10.38-	16.86
	Al Aqsa	-3.175-	4.187	1.000	-15.63-	9.28
	Naser	5.851	3.734	1.000	-5.26-	16.96
Al Najjar	EGH	9.966	3.955	.189	-1.80-	21.73
	Al SHifa	6.181	4.355	1.000	-6.77-	19.13
	AL Andonisi	9.417	4.700	.699	-4.56-	23.39
	Al Aqsa	3.006	4.318	1.000	-9.84-	15.85
	Naser	12.031*	3.881	.034	.49	23.57
AL Andonisi	EGH	.549	4.201	1.000	-11.95-	13.04
	Al SHifa	-3.236-	4.580	1.000	-16.86-	10.38
	Al Najjar	-9.417-	4.700	.699	-23.39-	4.56
	Al Aqsa	-6.411-	4.545	1.000	-19.93-	7.11
	Naser	2.615	4.131	1.000	-9.67-	14.90
Al Aqsa	EGH	6.960	3.770	.997	-4.25-	18.17
	Al SHifa	3.175	4.187	1.000	-9.28-	15.63
	Al Najjar	-3.006-	4.318	1.000	-15.85-	9.84
	AL Andonisi	6.411	4.545	1.000	-7.11-	19.93
	Naser	9.025	3.691	.231	-1.95-	20.00
Naser	EGH	-2.065-	3.259	1.000	-11.76-	7.63
	Al SHifa	-5.851-	3.734	1.000	-16.96-	5.26
	Al Najjar	-12.031-*	3.881	.034	-23.57-	-.49-
	AL Andonisi	-2.615-	4.131	1.000	-14.90-	9.67
	Al Aqsa	-9.025-	3.691	.231	-20.00-	1.95

**Appendix 10: Post Hoc Tests for Continuity of essential services
Multiple Comparisons**

(I) hospital	(J) hospital	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
EGH	Al SHifa	-4.614-	3.525	1.000	-15.10-	5.87
	Al Najjar	-3.265-	3.658	1.000	-14.14-	7.61
	AL Andonisi	2.656	3.886	1.000	-8.90-	14.21
	Al Aqsa	-2.460-	3.486	1.000	-12.83-	7.91
	Naser	5.029	3.014	1.000	-3.94-	13.99
Al SHifa	EGH	4.614	3.525	1.000	-5.87-	15.10
	Al Najjar	1.349	4.027	1.000	-10.63-	13.33
	AL Andonisi	7.270	4.235	1.000	-5.33-	19.87
	Al Aqsa	2.154	3.872	1.000	-9.36-	13.67
	Naser	9.643	3.454	.087	-.63-	19.91
Al Najjar	EGH	3.265	3.658	1.000	-7.61-	14.14
	Al SHifa	-1.349-	4.027	1.000	-13.33-	10.63
	AL Andonisi	5.921	4.347	1.000	-7.01-	18.85
	Al Aqsa	.805	3.993	1.000	-11.07-	12.68
	Naser	8.294	3.589	.329	-2.38-	18.97
AL Andonisi	EGH	-2.656-	3.886	1.000	-14.21-	8.90
	Al SHifa	-7.270-	4.235	1.000	-19.87-	5.33
	Al Najjar	-5.921-	4.347	1.000	-18.85-	7.01
	Al Aqsa	-5.116-	4.203	1.000	-17.62-	7.38
	Naser	2.373	3.821	1.000	-8.99-	13.74
Al Aqsa	EGH	2.460	3.486	1.000	-7.91-	12.83
	Al SHifa	-2.154-	3.872	1.000	-13.67-	9.36
	Al Najjar	-.805-	3.993	1.000	-12.68-	11.07
	AL Andonisi	5.116	4.203	1.000	-7.38-	17.62
	Naser	7.489	3.414	.443	-2.66-	17.64
Naser	EGH	-5.029-	3.014	1.000	-13.99-	3.94
	Al SHifa	-9.643-	3.454	.087	-19.91-	.63
	Al Najjar	-8.294-	3.589	.329	-18.97-	2.38
	AL Andonisi	-2.373-	3.821	1.000	-13.74-	8.99
	Al Aqsa	-7.489-	3.414	.443	-17.64-	2.66

**Appendix 11: Post Hoc Tests for recovery and adoption
Multiple Comparisons**

(I) hospital	(J) hospital	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
EGH	Al SHifa	-4.315-	3.841	1.000	-15.74-	7.11
	Al Najjar	-6.781-	3.986	1.000	-18.63-	5.07
	AL Andonisi	.157	4.234	1.000	-12.44-	12.75
	Al Aqsa	-3.522-	3.799	1.000	-14.82-	7.78
	Naser	4.522	3.285	1.000	-5.25-	14.29
Al SHifa	EGH	4.315	3.841	1.000	-7.11-	15.74
	Al Najjar	-2.465-	4.389	1.000	-15.52-	10.59
	AL Andonisi	4.472	4.615	1.000	-9.25-	18.20
	Al Aqsa	.794	4.220	1.000	-11.76-	13.34
	Naser	8.837	3.763	.299	-2.36-	20.03
Al Najjar	EGH	6.781	3.986	1.000	-5.07-	18.63
	Al SHifa	2.465	4.389	1.000	-10.59-	15.52
	AL Andonisi	6.938	4.736	1.000	-7.15-	21.02
	Al Aqsa	3.259	4.352	1.000	-9.68-	16.20
	Naser	11.302	3.911	.065	-.33-	22.93
AL Andonisi	EGH	-.157-	4.234	1.000	-12.75-	12.44
	Al SHifa	-4.472-	4.615	1.000	-18.20-	9.25
	Al Najjar	-6.938-	4.736	1.000	-21.02-	7.15
	Al Aqsa	-3.679-	4.580	1.000	-17.30-	9.94
	Naser	4.365	4.164	1.000	-8.02-	16.75
Al Aqsa	EGH	3.522	3.799	1.000	-7.78-	14.82
	Al SHifa	-.794-	4.220	1.000	-13.34-	11.76
	Al Najjar	-3.259-	4.352	1.000	-16.20-	9.68
	AL Andonisi	3.679	4.580	1.000	-9.94-	17.30
	Naser	8.043	3.720	.479	-3.02-	19.11
Naser	EGH	-4.522-	3.285	1.000	-14.29-	5.25
	Al SHifa	-8.837-	3.763	.299	-20.03-	2.36
	Al Najjar	-11.302-	3.911	.065	-22.93-	.33
	AL Andonisi	-4.365-	4.164	1.000	-16.75-	8.02
	Al Aqsa	-8.043-	3.720	.479	-19.11-	3.02