

Assessment of Disaster Preparedness at Shohada Al Aqsa Hospital in Gaza Strip

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Received: 25 December 2020; **Accepted:** 28 January 2021; **Published:** 15 February 2021

Abstract:

Gaza Strip is frequently living under unstable security situations, which raised the need to have emergency plans to enable hospitals to handle the increased casualties. Aim: This study aimed to assess Shohada Al Aqsa hospital preparedness for disasters. Methods: The study utilized descriptive, observational design. For data collection, the researcher used the modified Hospital Disaster Preparedness Assessment Tool developed by The American College of Emergency Physicians 2017. Results: The results showed that the average availability of safety and security measures was 77.8%, the average availability of logistics was 68.75%, the average availability of readiness and training was 59.52%, the average usage of triage system was 95.25%, and the average availability of communications, warning, and notification was 89.57%. Conclusion and recommendations: the results reflected a generally moderate level of preparedness for disasters. These findings must be considered as preliminary to further studies to improve the level of hospitals preparedness for crisis and disastrous events. The study recommended the need to conduct exercises and drills of the emergency plan to empower staff's knowledge and skills in managing emergency events more effectively.

Keywords:

Preparedness, Disaster, Gaza Strip, Logistics, Communication

1. Introduction

Disasters and crises are events that resulted in a heavy burden of morbidity and mortality. According to Global Assessment Report on Disaster Risk Reduction (2015), since 1990, 1.6 million people worldwide have died because of disasters, making for an approximate average of 65,000 deaths per year. During disasters, hospitals are expected to function as a safe environment for personnel and provide essential medical care to the casualties [1]. During disasters, hospitals are the main facilities within the healthcare system that provide medical care to casualties. Disasters and

crises can occur at any time, causing pain, human suffering, and loss of life. If hospitals are not prepared to deal with a disaster, both individual's and communities' vulnerability becomes even more pronounced. Thus, equipping hospitals for disasters is not an optional task. Strengthening stewardship, implementing preparedness planning as a continuous process with a multi-hazard approach, and establishing sustainable crisis-management and health-related risk-reduction programs are vital to any hospital [2].

The United Nations International Strategy for Disaster Risk Reduction – UNISDR, disaster preparedness means the capacity and ability of governmental and community organizations to respond effectively and recover from the negative impacts of disasters. Hospitals play a significant role in response and recovery from disastrous events and their role mainly focusing on saving lives [3]. Thus, hospitals must remain functioning all the time [4]. Gaza Strip suffered from three aggressive wars in the past years by Israeli military forces; in December 2008 for 21 days, in November 2012 for eight days. In July 2014, for 51 days, these wars left thousands of martyrs wounded people of different ages. Besides, the Great Return March (GRM) started on the 30th of March 2018, added extra pressure on the healthcare system and, more specifically, the hospitals in GS. The hospitals are overwhelmed with casualties suffering from different complicated severe injuries, and the hospitals suffered from a severe shortage of medical supplies and consumables. Medical staff had to work under pressure and scarcity of supplies. These circumstances led the researcher to carry this study to investigate the degree of hospitals' preparedness to face such critical events, in the light of obtained results to suggest a plan of actions to manage such urgent circumstances.

2. Research Problem

From the researcher's experience as a nurse working in governmental hospitals in GS, I noticed that hospitals suffer from insufficient resources, including supplies, essential drugs, and personnel, who affects their ability to offer safe, quality care to patients and victims. This is consistent with results of previous studies which revealed weakness in hospital disaster management, including confusion over roles and responsibilities, poor communication, lack of planning, and suboptimal training [1,5,6]. These findings raised the need to improve disaster management and crisis events and treat the high number of victims properly.

2.1. General Objective

The general objective of the study is to assess the crisis and disaster preparedness of Shohada Al Aqsa hospital in the Gaza Strip.

2.2. Literature Review

Health facilities play an essential role in the socio-economic and psychological recovery of the population from a disaster. They are considered especially important because of their role in saving the lives of the affected people. Their part is to provide medical care and protect patients at the time of disaster. Hospitals, as one kind of health facility in cities, must withstand hazards and remain functioning [4].

Preparedness is defined as “actions are taken to anticipate effectively, respond to, and recover from the impact of likely or current hazard events or conditions” [3]. It is vital to hospital disaster preparedness that the plan for a massive influx of casualties is

known and understood by professionals who will apply it, including ED staff [7]. Hospitals need to be ready and well prepared for emergency events. Hospitals are central to provide emergency care, and hence when a disaster strikes, the society depends on the hospitals to provide immediate emergency medical care [8]. Even though there are various management systems and guidelines for disaster and emergencies, there are still differences between hospitals in terms of their preparedness for disasters, reflecting how some hospitals have a different management system level than others [9]. Differences are in many areas, such as the hospital's ability to perform the identified tasks, characteristics, and management styles; these differences are affected by its size, location, and community [10]

Hospital readiness is a multidimensional term that is related to medical restrictions and other relevant conditions. Managers of health institutions should thoroughly know the hazards of crises and improve their readiness to confront these conditions (Kearns et al., 2014). One of the leading indicators in determining hospitals' readiness is the ability of their personnel. Many hospitals suffer inadequate beds and nursing services during crises. Appropriate readiness is needed for a proper reaction to unexpected events. Every event is unique, and each hospital has its situation, but there must be a clear plan to confront the crises in all hospitals [11,12]. Thus, an appropriate plan against crises needs expertise, education, resources, and readiness to be cost and time effective and can afford other hospital requirements [13].

A cross sectional study carried out in Japan found a low rate of preparedness with a mean score for preparedness was 2.63, response abilities were 2.02, and evaluation was 2.05 (all scored below normal on a 6-point Likert scale) [14]. Another study found that the average level of disaster management preparedness in the health systems of EU member states was 68%. The highest level of preparedness was seen in health information elements (86%), and the lowest level was in educational elements (54%) [1]. In India, a cross-sectional study reported that 40.5% of the study participants knew the concept of a disaster plan, whereas 61.3% were aware of disaster drills, 83.3% had a positive attitude towards the fact that all healthcare workers should be aware of the disaster plan, 90.5% felt that training for disaster preparedness is essential for all staff, and 82.7% agreed that management should be prepared for disaster, 70% of the participants were not aware of any drills being conducted at the hospital whereas 93% of the participants were not aware of the hospital was conducting any training for disaster preparedness [15].

A study conducted in Tehran reflected that 33% of hospitals had specific programs to increase the capacity of the hospital for admitting the injured and victims, 36.8% of the hospitals provided the hospital staff duties during the crisis, but 52.4% of them have been treatment teams for delivering health services during crises, admission and registration system is somewhat reasonable [16].

A study carried out in Saudi Arabia found that 64% were drilling for disasters at least twice per year, 79% of hospitals had their command system present in their plans. All hospitals described the availability of some supplies required for the first 24 hours of disaster response, and 36% of hospitals had a designated decontamination area, 64% of hospitals reported the ability to re-designate inpatient wards into an intensive care unit (ICU) format, 50% respondents had a protocol for increasing availability of isolation rooms to prevent the spread of airborne infection, and 71% of hospitals had a designated disaster-training program for health care workers [17].

In Jordan, a cross-sectional survey reported that 65% of respondents described their current disaster preparedness as weak, 18% medium, 12% good, and 5% felt their preparation was very good. Also, 31% received disaster education in undergraduate programs, 8% in graduate nursing programs, 31% in facility drills, and 22% in continuing education courses, while 11% had participated in a real disaster [18].

3. Methods

The study utilized descriptive, cross-sectional, observational design. The study was conducted at Shohada Al Aqsa hospital in the mid-zone of the Gaza Strip.

3.1. The Instrument of the Study

The researchers used constructed observation checklist (Appendix A) to assess hospital disaster preparedness. The checklist was adapted with modification, based on the Hospital Disaster Preparedness Self-Assessment Tool, developed by The American College of Emergency Physicians (ACEP) and the Hospital Emergency Analysis Tool [19]. The domains included in the checklist are safety and security, availability of logistics, readiness, and training, usage of the patient triage system, and availability of communications, warning, and notification.

3.2. Data Collection and Management

The researcher had collected data by observation of selected areas according to the checklist. The study was carried out during the year 2018. The observation was done during working hours, day, evening, and night. The researcher used SPSS (version 22) for data analysis.

4. Results

Table 1 shows that security personnel is available 24 hours a day in ED. All entrances and exits are controlled, monitored with cameras, and can be locked. The average availability of safety and security measures was 77.8%.

Table 1. Safety and security.

Item	Availability	%
Security personnel on duty 24 hours/ 7 days per week in ED	No	0
	Yes	100.0
The hospital can post additional security personnel in ED	No	50.0
	yes	50.0
An available armed police force	No	33.3
	Yes	66.7
The hospital has a memorandum of understanding with local law enforcement to provide additional security	No	16.7
	Yes	83.3
A plan is in place to provide information to large numbers of concerned family and friends and to control crowds	No	33.3
	Yes	66.7
All entrances and exits are controlled, monitored with cameras, and can be locked	No	0
	Yes	100.0
Average	No	22.2
	Yes	77.8

Table 2 shows that the hospital has medical gasses to last 3-4 days without re-supply. The hospital can isolate and shut down Heating, Ventilation, and Air Conditioning (HVAC) system zones in an emergency. The average availability of logistics was 68.75%.

Table 2. Availability of logistics.

Item	Availability	%
The hospital has medical gasses to last 3-4 days without re-supply	No	0
	Yes	100.0
Medical gasses are in a secured area	No	16.7
	Yes	83.3
Maintenance and engineering staff are available 24 hours a day	No	50.0
	Yes	50.0
The hospital can isolate and shut down Heating, Ventilation, and Air Conditioning (HVAC) system zones in an emergency	No	0
	Yes	100.0
HVAC shutdown has been exercised in the past year	No	33.3
	Yes	66.7
Guidelines are in place for emergency HVAC shutdown	No	83.3
	Yes	16.7
The hospital has procedures for the management, transfer, and disposal of contaminated wastes, goods, and fluids	No	16.7
	Yes	83.3
The hospital maintains a current inventory of equipment and supplies required to respond to a mass casualty event effectively	No	50.0
	Yes	50.0
Average	No	31.25
	Yes	68.75

Table 3 shows that the hospital has exercised evacuation of staff and patients in the last 12 months (83.3%), the hospital uses after-action reports to identify strengths and weaknesses of the EMP (83.3%), the hospital exercises EMP at least twice per year (33.3%). The average availability of readiness and training was 59.52%.

Table 3. Readiness and training.

Item	Availability	%
The hospital exercises EMP at least twice per year	No	66.7
	Yes	33.3
The hospital participates in at least one community-wide exercise /year	No	33.3
	Yes	66.7
All ED personnel participate in at least twice-annual mass casualty exercises	No	50.0
	Yes	50.0
The hospital has exercised evacuation of staff and patients in the last 12 months	No	83.3
	Yes	16.7
The hospital has a procedure for conducting after-action reviews of simulated or actual emergency events	No	16.7
	Yes	83.3
The hospital uses after-action reports to identify strengths and weaknesses of the EMP	No	16.7
	Yes	83.3
The hospital incorporates information gathered from after-action reports into its EMP	No	16.7
	Yes	83.3
Average	No	40.48
	Yes	59.52

Table 4 shows that the hospital uses a triage system (100%), the hospital has an alternate treatment area to accommodate casualty surge/overload (100%). The average usage of the triage system was 95.25%.

Table 4. Usage of patient triage system.

Item	Availability	%
The hospital uses a triage system	No	0
	Yes	100.0
Triage tags are maintained in ED	No	0
	Yes	100.0

The protocol includes the ‘deceased’ category for victims beyond help (Black)	No	33.3
	Yes	66.7
The protocol includes ‘immediate’ category for life-threatening condition (Red)	No	0
	Yes	100.0
The protocol includes the ‘delayed’ category for serious non-life-threatening condition (Yellow)	No	0
	Yes	100.0
The protocol includes the ‘minor’ category for minimal care requirement (Green)	No	0
	Yes	100.0
The hospital has an alternate treatment area to accommodate casualty surge/overload	No	0
	Yes	100.0
Average	No	4.75
	Yes	95.25

Table 5 shows that the hospital can receive warnings of imminent emergency conditions from external agencies (100%), the hospital can notify on-duty and off-duty staff of emergency status and recall to duty (100%). The average availability of communications, warnings, and notifications was 89.57%.

Table 5. Availability of communications, warning, and notification.

Item	Availability	%
The hospital can send and receive an emergency warning and notification information	No	16.7
	Yes	83.3
The hospital can receive warnings of imminent emergency conditions from external agencies	No	0
	Yes	100.0
The hospital can send warnings to external agencies	No	0
	Yes	100.0
The hospital can notify on-duty and off-duty staff of emergency status and recall to duty	No	0
	Yes	100.0
The hospital has a plan to notify on-duty and off-duty staff of emergency status	No	16.7
	Yes	83.3
The hospital has staff notification with up-to-date, verified phone and other contact information	No	16.7
	Yes	83.3
Staff can receive warnings by text messages on their wireless phones	No	16.7
	Yes	83.3
Specific spokespersons have been identified for particular events	No	16.7
	Yes	83.3
Average	No	10.43
	Yes	89.57

5. Discussion

Hospitals are the core of the health system and should be a source of strength during emergencies and disasters, and should be ready to save lives and continue providing essential care to patients. Availability of logistics was moderate, moderate readiness and training for disastrous events, high triage system usage, and high availability of communications, warning, and notification. The results obtained by Al-Shareef [17] showed that two-thirds of hospitals reviewed their disaster plan within the preceding two years, two-thirds were drilling for disasters at least twice per year, and the majority of hospitals did not rely on a hazard vulnerability analysis to develop their EP. Al Khalaileh [18] found that more than two-thirds of respondents described their current disaster preparedness as weak, one-fifth described it as a medium, and very few described it as good or very good.

Moreover, Visser et al. [19] reported that within the hospital system, the first stage on arrival at the ED is the assessment by the hospital triage nurse, and the triage nurse

will evaluate the patient's condition, as well as any changes, and will determine their priority for admission. Triage concerns with the methods used to assess patients' severity of injury or illness within a short time after their arrival, assign priorities and transfer each patient to the appropriate place for treatment [20].

Communication is an essential component in any emergency event. Our results indicated that the hospital has communication systems and can send and receive emergency warnings and notifications. This result agreed with deBoisblanc, (2005), who emphasized that ensuring that internal and external communication systems function is vital during emergency events to ensure adequate staffing and coordination with other health and community facilities. Rabkin (2005) reported that to prevent communication breakdown during disasters, healthcare facilities must have sufficient, collaborative interdisciplinary and intergovernmental planning for interoperable communications.

6. Conclusions

The results reflected a moderate level of preparedness for disasters in the following aspects: safety and security, availability of logistics, and readiness and training, and these findings must be considered as a preliminary to further studies to improve the level of hospitals preparedness for crisis and disastrous events. A higher level of readiness was observed in the patient triage system's usage and the availability of communications, warnings, and notifications.

7. Recommendations

The study recommended the need to increase the number of security personnel to control the crowd during crisis events, maintain adequate stock and supply of logistics such as medical gases, and conduct exercise and drills of the emergency plan to empower staff's knowledge and skills managing emergency events more effectively.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Ethical Considerations

Compliance with Ethical Guidelines

Before starting the study, ethical approval to conduct the study was obtained from the Helsinki Committee and the Palestinian Ministry of Health.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Author Contributions

Concepts, design, manuscript preparation, reviewing the questionnaire, and manuscript editing done by the author.

Acknowledgments

The researcher would like to thank the director and key informants at Shohada Al Aqsa hospital for their cooperation during data collection.

Limitation of the Study

The study was limited to Shohada Al Aqsa hospital; therefore, this study's results can't be generalized to other hospitals. Furthermore, interviews should be carried out with hospital staff to gain more insight into the hospital's readiness to face crises and disastrous events.

Appendix A

Table A1. Observation Checklist.

No.	Item	Yes	No
Safety and security			
1	Security personnel on duty 24 hours/ 7 days per week in ED		
2	The hospital can post additional security personnel in ED		
3	Available armed police force		
4	The hospital has a memorandum of understanding with local law enforcement to provide additional security		
5	A plan is in place to provide information to large numbers of concerned family and friends and to control crowds		
6	All entrances and exits are controlled, monitored with cameras, and can be locked		
Availability of logistics			
1	The hospital has medical gasses to last 3-4 days without re-supply		
2	Medical gasses are in a secured area		
3	Maintenance and engineering staff are available 24 hours a day		
4	The hospital can isolate and shut down Heating, Ventilation, and Air Conditioning (HVAC) system zones in an emergency		
5	HVAC shutdown has been exercised in past year		
6	Guidelines are in place for emergency HVAC shutdown		
7	The hospital has procedures for management, transfer, and disposal of contaminated wastes, goods, and fluids		
8	The hospital maintains current inventory of equipment and supplies required to effectively respond to a mass casualty event		
Readiness and training			
1	The hospital exercises EMP at least twice per year		
2	The hospital participates in at least one community-wide exercise /year		
3	All ED personnel participate in at least twice-annual mass casualty exercises		
4	The hospital has exercised evacuation of staff and patients in the last 12 months		
5	The hospital has a procedure for conducting after-action reviews of simulated or actual emergency events		
6	The hospital uses after-action reports to identify strengths and weaknesses of the EMP		
7	The hospital incorporates information gathered from after-actions reports into their EMP		
Usage of patient triage system			
1	The hospital uses a triage system		
2	Triage tags are maintained in ED		
3	Protocol includes 'deceased' category for victims beyond help (Black)		

4	Protocol includes 'immediate' category for life-threatening condition (Red)		
5	Protocol includes 'delayed' category for serious non-life-threatening condition (Yellow)		
6	Protocol includes 'minor' category for minimal care requirement (Green)		
7	The hospital has an alternate treatment area to accommodate casualty surge / overload		
Availability of communications, warning, and notification			
1	The hospital can send and receive emergency warning and notification information		
2	The hospital can receive warnings of imminent emergency conditions from external agencies		
3	The hospital can send warnings to external agencies		
4	The hospital can notify on-duty and off-duty staff of emergency status and recall to duty		
5	The hospital has a plan to notify on-duty and off-duty staff of emergency status		
6	The hospital has staff notification with up-to-date, verified phone and other contact information		
7	Staff can receive warnings by text messages on their wireless phones		
8	Specific spokespersons have been identified for specific events		

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