

# Hospitals Disaster Preparedness during Arab Spring in Yemen

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**Abstract—Objective:** The objective of this paper is to assess the hospitals preparedness for emergency using WHO standards.

**Method:** This is a cross-sectional study, consisted of site visit, questionnaire survey, 16 health facilities were included. The WHO standard for emergency preparedness of health facilities was used to evaluate and assess the hospitals preparedness of health facilities.

**Result:** 13 hospitals were responded. They scored below average in all measure >75%), while above average score was in 7 out of 9 nine measure with a range of 8%-25%. Un acceptable below average was noted in two measures only.

**Discussion:** The biggest challenge facing the hospitals in their emergency intervention is the lack of pre-emergency and emergency preparedness plans as well as the coordination of the hospitals response mechanisms.

**Conclusion:** The studied hospitals presently are far from international disasters preparedness protocols. That necessitates improvements in emergency preparedness, as well as in physician skills for injury management.

**Keywords**—Arab Spring, Yemen, Hospital Preparedness, Disaster.

## I. INTRODUCTION

DISASTERS occur as a result of natural, Road Traffic Accidents incidents, terrorism or other means resulting tremendous flow of patients to the hospitals seeking emergency aid necessitating the need for an organized emergency trauma response [1]. Mankind experienced a wide range of disasters all over the world, but unfortunately there is no hospital preparedness in order to save life's and dignity of patients [2]-[5]. This has been shown clearly upon evaluation of the trauma response capabilities of U. S. hospitals that were involved in major incidents such as the 9/11 terrorist attacks in 2001 and Hurricane Katrina in 2005 [2]-[5]. Therefore, the WHO recommends periodic assessment of the capacity of health facilities' response to emergencies (WHO 2011).

The Arab Spring is a turning point in political states it started from Tunisia and spread to Egypt and then to Yemen.

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During the spring hospital in Yemen received Mass Casualties due to the violence experienced towards the civilians revolutionary, all methods of intimidation and violence to deter young people saluting combine youth and demonstrators Thousands in the fields of protest and police tried units Disengagement riot and counter-terrorism and even special forces break this Youth Gathering great all forms of power - ranged from tear gas and beatings with batons and fire district and the burning tents and grab young people and the use of Molotov cocktails and artillery, CS tear gas and rockets, bombs and street fighting and bombs for petrol, which led to victims and there was a large counter-violence by the bull where the violence with violence was extended until it reaches the attempted assassination of the President of Yemen planting bombs in the presidency behind the mosque bombing a large number of casualties among civilians and military personnel in addition to causing the President. Despite the significant progress Yemen has made to expand and improve its health care system over the past decade, the system remains severely under developed. Total expenditures on health care in 2004 constituted 5% of gross domestic product. In that same year, the per capita expenditure for health care was very low compared with other Middle Eastern countries. Health service coverage about 67% of the population but only 35% for the rural population, Mal-distribution of human resources, with distribution favoring urban areas, and 42% of physicians working in four governorates, and a shortage of employed female staff. A large private sector, primarily in urban areas, with limited government regulation and supervision (MoPHP, 2010). During Arab Spring most of the hospitals showed malfunction in to receive and manage the flow of the patients reflected gaps in the Yemeni disaster hospital preparedness. A hospital preparedness in Yemen has not been addressed before. The aim was to study level of preparedness for disaster in hospitals in Yemen. Sana'a was chosen because All health services are concentrated very heavily in the capital Sana'a and it is was the main city where most violence events and mass gathering was there during the Yemeni spring and Patients are referred to Sana'a from all cities in the spring. This was compared with international best practices using the WHO hospital evaluation questionnaire as a tool.

## II. METHOD

This is a cross-sectional study of purposively selected health facilities. Consisted of site visit, questionnaire survey. The study was conducted between February 2010 and May

2012. A total of 16 health facilities. Sana'a representing the best medical health care service in the country was covered. The following data collection techniques were used. Field visits were paid to the Hospitals, which was used as a case study for the handling and treatment of revaluation victims from the point of ignition to the ward. The Principal Investigator conducted a face to-face interview with key informants.

#### A. Survey Tool

The World Health Organization, (2011) Hospital emergency response checklist it is standard for emergency preparedness of health administered to the participating hospitals. In the health facilities for the element: 1. Command and control, 2. Communication, 3. Safety and security, 4. Triage, 5. Surge capacity, 6. Continuity of essential services, 7. Human resources, 8. Logistics and supply management, 9. Post-disaster recovery., interviews were conducted with key medical officers and, or head of emergency department.

### III. ANALYSIS

The completed questionnaires were translated into simple matrix checklist with the respective responses assembled for easy comparison. Analyses were performed using SPSS software (SPSS for Windows 6.1, SPSS Inc, Chicago, Illinois.

#### A. Ethical Issues

Permission was sought from all the in-charges of the select health facilities in the study. The in-charges and interviewees were assured of confidentiality of their data. Data safety and usage were purposely for academic work. There were no risks of using the data and the benefits of using the data were immense, such as publishing the findings to guide policy. Furthermore, there was no conflict of interests.

### IV. RESULTS

#### A. Hospital Emergency Preparedness in Disaster

Valid responses were received from 13 (81.25%) of the 16 hospitals surveyed. We used the following descriptors to indicate whether facilities were average, above average, below average or unacceptable below average thus: A Average is 50%+, AA = Above Average is 50%+, BA = Below Average is 10-49%, AU = Unacceptable below Average is <10%.

Above average in all measures was noticed in seven out of the nine measures, logistics (23%), communication (23%), triage (15.3%) safety (15.3%), human (7.6%), recovery (7.6%), and continuity (7.6%). capacity and command (0 %) (fig. 1).

Below average was noticed in all in recovery, human 84%, continuity & safety (76.9%), capacity (69%). command, communication and triage 53.8%, logistic 38.4%.

The high percentage of unacceptable below average was noticed in command (46%) logistics & triage (30.7%) (Fig. 1).

Unacceptable below average was seen in command (46%) logistics & triage (30.7%).

Most attention element was in logistics (23%), communication (23%) Above average in general and it was in military hospitals.

There is a serious disregard in recovery, human 84% continuity & safety (76.9%), capacity (69%). command, communication and triage 53.8%, logistic 38.4%.

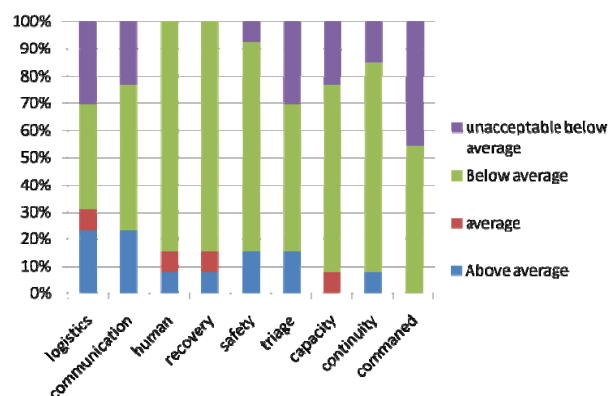


Fig. 1 Result of hospital preparedness in disaster for all hospitals

External disaster plans only one 7.6% but not used or no drill for the plan is done, only 2 of respondents showed they had internal disaster plan only for administrative purpose. 23 % had communication channel with the authority during disaster, only about 15.3 % had protocols for triage. Staff training or programs were reported in 30 % of the hospitals; 0% had periodically assessed the efficacy of staff training or drill; 0 % had experts to provide psychological counseling.

In emergency cases brought to the hospitals, 54.5% (AB) of the facilities said they provided "free treatment of patients during disaster situations", At the time of visit to the health facilities in this study in 2012, none of them had a dedicated ambulance to respond to emergencies outside of the hospitals.

### V. DISCUSSION

To the authors' knowledge the current study is address hospital disaster preparedness in Yemen the first to draw upon the pooled experience of hospitals during the last political event that lead to large deaths. Disaster preparedness for effective response at all levels has not as yet received attention in Yemen, as the planning focus has been on disaster relief and recovery operations [8]. The results of this survey revealed that all the hospital are below average 65.79% and mostly unacceptable below average which mean the disaster are managed most of the time in chaos. This is in agreement with the reports Manley et al who showed that The U.S. health care system remains unprepared despite the influx of large amounts of government money. (R) Although it has been reported earlier that hospital readiness for likely emergencies and disasters remains uneven across any country and, without a significant disaster experience, many hospitals remain unprepared [9], our findings results suggest that much work remains to be done.

Results revealed that in incident command system all are below average 100%, Governmental and Privet = Unacceptable Below Average 6 (46%). Confusion and chaos are commonly experienced by the hospital at the onset of a medical disaster. A well-functioning command-and-control system is essential for effective hospital emergency-management operations. Implementation of HEICS which is an emergency management system which employs a logical management structure, defined responsibilities, clear reporting channels, and a common nomenclature well help unify hospitals with other emergency responders.

Crisis communication, as an important part of a disaster response, is key to ensuring complete, transparent and prompt information exchange, and to help hospitals make timely responses and reduce the serious consequences [10].

Human resources staff in the results of this survey revealed that 11 hospitals Below Average (84.6%), Effective human resource management is essential to ensure adequate staff capacity and the continuity of operations during any incident that increases the demand for human resources. The hospital must have a sufficient number of staff to provide the essential care needed during an emergency. Maintaining adequate staffing may be a difficult task due to staff absenteeism. The hospital will also have to ensure the staff's safety during the emergency.

Well-developed safety and security procedures are essential for the maintenance of hospital functions and for incident response operations during a disaster. The results of this survey revealed that most of the hospitals are Below Average= 10 (76.9%) only two Governmental are Above Average 2 (15.3%). Unfortunately all of Privet hospital are below average.

Maintaining patient triage operations, on the basis of a well-functioning mass-casualty triage protocol, is essential for the appropriate organization of patient care. The results of this survey revealed that most of the hospitals are Below Average 10 (76.9%), only three are Above Average 3 (23%), Governmental only two are above average, unfortunately most of Privet hospital are below average. Surge capacity an important factor of hospital disaster response and should be addressed early in the planning process. The lack of hospital surge capacity must be addressed to improve disaster preparedness, most of the hospitals are Below Average 11 84.6% unfortunately all of Privet hospital are below average. Continuity of the hospital supply and delivery chain is often an underestimated challenge during a disaster, requiring attentive contingency planning and response. The results of this survey revealed that most of the hospitals are Below Average 9 (69.2%) Above Average 3 (23%) 1 average (7.6%) 7 Unacceptable average (53.8%).

Prompt implementation of recovery efforts can help mitigate a disaster's long-term impact on hospital operations. The results of this survey revealed that most of the hospitals are Below Average 11(84.6%) Governmental 1 (7.6%) is average, 5 (38.46%) below average Privet all are below average one is above average.

Disaster can cause psychological as well as physical problems for the public and medical staff attending to victims [11]. The results of this survey revealed that is very poor and no one hospital are concern in it.

However, hospital preparedness for disaster in Sana'a (Yemen) was at an early stage of development. Comprehensive measures should be taken to enhance hospital preparedness in the prevention and management of disaster. The inadequacies of the hospital system in Yemeni responding to emergencies raise serious public health concerns and other disaster. The biggest challenge facing the hospitals in their emergency intervention is the lack of pre-emergency and emergency preparedness plans as well as the coordination of the hospitals response mechanisms. Part of the solution in developing good practices for pre-hospital emergency management, is to provide both long-term and short-term approaches. The development of Hospital Emergency Plans for the hospital system of Yemeni in the short-term can be achieved at little or no cost to either the individual hospitals or the Government.

Developing emergency plan and teams as well as incident command structures do not cost money as well. Executing triage standards to be applied nationally does not involve a great deal of money but the political will of the supervisory ministry or agency of the hospital system in Yemen. The plan should provide for partial or complete evacuation of the facility including Intensive Care Unit (ICU), prenatal and antenatal units in case of fire, explosion, accidental release of gaseous material, flooding or water mains burst or collapsed roof structure or criminal invasion of the facility. Evacuation of a facility such as a hospital, presumes a safe haven or resettlement of the patients to a secondary facility or a different location, which could be achieved through Mutual Aid Agreements (MAA) [6]-[8].

Due to competition within government hospitals and between private hospitals and doctors, cooperation can negatively affect emergency response capabilities of a district. Some experts believe that in severe emergencies, all hospitals and doctors pull together to address the exigency despite competition.

EMS in Yemen not existed till now only road ambulance service for traffic accident distributed in road not respond to other. In emergency cases brought to the hospitals the governmental hospital only give free medical treatment, 54.5% (AB) of the facilities said they provided "free treatment of patients during disaster situations", which may suggest that they do not always care for emergency disaster cases.

The guideline for such a determination is informed by the internationally recognized standard that, the offer of free medical services should be in situations where there is a national or regional and district wide official emergency declaration consistent with local or national legislation. All hospitals they did not have paramedics staff.

## VI. CONCLUSION

The study revealed that the studied hospitals presently are far from international protocols of preparedness for disasters. It was found that the awareness for preparedness is lacking.

We hope this study will make a shift point in the settings of hospitals during disasters, as the events of September changed the world and learned to America and from behind the world a lesson in preparing disaster.

This situation calls for improvements in emergency preparedness, together with improvements in physician skills for injury management.

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