Criteria for Disaster Preparedness Assessed by Hospital Management in Lebanese Hospitals

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Abstract

The aim was to define if a consensus could be reached on the criteria for a hospital disaster plan based on the WHO model mainly. The Delphi technique in two rounds was used to consult the hospital manager's opinion by using statements that correspond to the criteria's to be present in the plan.

Out of the 41 hospitals chosen, 14 hospitals participated in the 2 rounds. Full consensus was reached and the aim was achieved.

The consensus statements were regrouped in four categories.

77% of the statements were positive statements; no negative statements were noted. No differences were noted in term of profile of hospitals and participants.

The variance of positive consensus, especially for the strongly agree level was analysed by dividing statements to two groups.

The statements higher than 70% were related to the organization, food, internal communication, logistic system, restructuring units, management of dead bodies, human resources, documentation and evacuation.

The statements lower than 70% were related to the need to review and exercise the plan, communication tools, logistics, staff and health security, funds, public information, activation and reporting system and the transfer between hospitals.

The result can serve as a baseline for future development in disaster preparedness.

Keywords: Criteria; Statements; Strongly Agree; Consensus

Introduction

Hospital disaster plans are essential parts in the chain of disaster preparedness. With the increase of risks, both of man-made and natural disasters, hospitals find themselves obliged to start preparation [1,2]. To prepare, hospitals need reference guidelines or tools that help them in preparing the plan [3]. In Lebanon, no guidance by the official authorities' exits, hospitals depend on their experience that they had during the civil war and other crisis, to develop their preparedness plan. On the other hand, World Health Organization (WHO) has approached this subject and developed models and tools for the health facilities to enhance their preparedness.

Lebanon is a small country of 10,452 sq.KM located in the middle east, surrounded by Syria in the North and East, by the sea on the west and by Israel in the South. The total number of population is around 4 million with 89% living in urban areas [4]. The health system service in Lebanon is a curative rather than a preventive system and counts on the private sector and Non-Governmental Organizations

(NGO) to provide the service. 80% of hospitals are private owned by persons in majority or belong to religious institutions [5]. The number of hospitals in Lebanon is around 150, distributed between 124 private and 26 public. There are various Emergency Medical Services (EMS) that work in Lebanon two are assigned by the Lebanese authority, which are the Lebanese Red Cross (LRC) and the Civil Defense (CD). Other EMS belongs to political and/or religious group. No coordination exists between these providers. Despite the high number of physicians per population, 35.4 per 10'000 in 2009 [6], the lack of specialist in emergency medicine is a problem. This specialization is not taught in Lebanon and General Practitioners (GP) who wants to specialize in this field have to study abroad.

The only existing official body that has a connection with disasters is the High Relief Commission (HRC). This governmental institution that was created in 1976 has a limited role; it acts mainly in relief as receiving and distributing donations in addition has the role to assess the damages following any disaster or conflict and to give the compensations for the damaged [7,8].

Since 2000, the Lebanese government has started the process of accrediting the hospitals [9]. This process has not included the concept of preparedness until 2008, when some new standards were added. Hospitals in Lebanon are obliged to apply the standards in the accreditation in order to get a budget from the ministry. The hospital disaster plans currently exist in the Lebanese hospitals. Yet, the accreditation process does not examine the plan content and scores a point if the hospital has a plan or not. The content of these plans is not shared publicly. The content and the size of the plan vary between the hospitals and this depends on many factors like: the hospital experience, the person key taking in charge the disaster plan process, and the seriousness of this issue in the eye of the hospital. Furthermore, there is in Lebanon, no consensus regarding what part that should be included in a disaster plan.

Aim of Study

The aim of this study was to highlight criteria that could be included in a hospital disaster plan, based on a national consensus.

Materials and Methods

The Delphi consensus method [10] comprising two rounds, was chosen. The first round included a questionnaire based on a literature review. The second round included the same questions with the results of the first round in order to allow the participants to reflect on the questions.

Inclusion criteria for the participants were that they should be managers (general director, medical director, administrative director or the quality director) working in a hospital that has a total capacity superior to 100 beds in order be included in the study.

The design of the questionnaire was constructed on the format of a mix open and closed question, with a small variation between the first and the second questionnaire. In the first questionnaire, there were two sections. The first section was open-ended questions and treated the characteristic of the hospital and the participants. The second section, which constitutes the essential part of the study, deals with the components to include in a disaster plan, in form of statements. The two main references used to design this section were WHO-EUROPE manuals [11,12]. The second questionnaire comprised the same statements as the first questionnaire in addition to the definition of Mass Casualty Events (MCE) and the result of the first round (Table 1).

In the design of the questionnaire, a five point Likert Scale was adopted: Strongly disagree, Disagree, Neither disagree or agree, Agree or Strongly agree.

The consensus level adopted was 80% on positive agreements, Agree and/or Strongly agree. The first questionnaire, sent to 41 hospitals by email and the fax, started in July 22nd 2011 and the second one in September 6th. Reminders by phone calls were done one week after the survey was sent.

The results were presented in relation to two approaches:

1. The first approach looked at the variable in the first section compared to the statements in the second section to explore if the results were related to the geographical location, the hospital functionality, or the person responding background and experience.

2. The second approach addressed the divergence of positive consensus, especially for the strongly agree level and compared it with statements treating the same topic. The statements relating to the Strongly Agree level were separated into two categories, the first where 70% or more of the responders had answered strongly agree, and where less than 70% had this answer.

	Statement	Consensus level indicated in percent out 14 responders		
		Neither agree or disagree	Agree	Strongly agree
	I. Relating to organization			
1	It is essential that there is a hospital emergency response plan.	0	7	93
2	There is a need for a committee composed of key managerial persons from different departments to elaborate the emergency response plan of the hospital	0	14	86
3	The plan needs to be reviewed, exercised, revised and updated on a yearly basis	0	36	64
4	There is a need to link the hospital emergency response plan with a local and regional multi-sector emergency plan	0	29	71
5	The Hospital emergency response plan should be complemented with Standard operating procedures (SOP)*	0	14	86
6	Hospital emergency response plans should include activation mechanisms to switch to an emergency mode	0	29	71
7	Hospital command system is a component to be included in the hospital emergency response plan	7	14	79
8	Restructuring of units and reorganization of space to improve beds capacity in ER should be included in the hospital plan	0	14	86
9	Mechanism of transfer between the hospitals needs to be included in the hospital plan	0	36	64
10	Activation and reporting system is essential in the hospital plan	0	36	64
11	An evacuation plan needs to be included in the hospital plan	0	14	86
12	Rules for evaluation and reporting following the activation of a plan should be added to the hospital plan	0	21	79
	II. Related to Logistics			
13	Guidelines and procedures for the management and use of logistic systems in emergency situations, should be included in place	0	21	79
14	Pre-established agreements with partners and/or private companies for the provision of logistic services, to ensure that essential functions can continue to operate, needs to be planned	7	36	57
15	Procedures for ensuring the back-up of critical resources (water, electricity, heating etc,) needs to be addressed in the hospital plan	0	21	79
16	Procedures for stocking of medicines have be included in the hospital plan	0	14	86
17	Procedures for stocking of supplies have to be included in the hospital plan	0	14	86
18	Procedures for stocking of equipment have to be included in the hospital plan	0	29	71
	III. Related to Communication			
19	Rules that define internal communication between the departments and the key persons defined in the disaster plan, needs to be included in the plan	0	1	86

20	Rules about the availability and the use of special communication tools like beeper, satellite, walkie talky should be available in the plan	0	36	64
21	Rules on how to perform public information must be included in the hospital plan	14	29	57
22	Media communication and management needs to be included in the disaster plan	7	14	79
	IV. Related to HR			
23	Organization and procedure that treat the staff and health facility security during emergencies have be included in the hospital plan	7	36	57
24	Training of staff on disaster plan constitutes a necessity to include in the hospital plan	0	7	93
25	An updated database of trained staff for emergency management must be part in the hospital plan	0	21	79
26	A human resource plan to have the needed human resources in disaster should be part in the hospital plan	0	14	86
27	A job Action sheet is a necessity in the hospital plan	0	29	71
	V. Non- Related			
28	Food and nutrition needs for the patients and staff should be included in the hospital emergency response plan	7	7	86
29	Management of mass fatality and dead bodies should be included in the hospital plan	0	14	86
30	Funds constitute a need to be included in the hospital plan	7	50	43
31	Exercise must be foresee to test the hospital plan	0	14	86

Table 1: *Results on consensus level for criteria to be included in disaster plan answered by managers from 14 different hospitals in Lebanon. Categorization of statements included in questionnaire and level of consensus. No statements fell into the "Strongly Disagree" or "Disagree" level.*

To highlight the main topics, the statements were grouped into 5 separate categories: Statements related to organization, statements related to logistics, statements related to internal communications, statements related to human resources (HR) and non-related statements.

SPSS system was used to perform the data analysis.

Results

The response rate was of 43% (n = 18) in the first round and 34% (n = 14) in the second round 86% were private hospitals, versus 14% public. The background of the respondents was mainly health related (85%), with 74% of them with more than five years of experience (Table 2 and 3).

The number of proposed statements included was 31. All of these reached the set consensus level at 80%.

There was no relation between the variable in the first section compared to the statements in the second section (Less than 1%).

The statements higher than 70% of Strongly agree included the organization, food, internal communication and media, logistic system and stocking, restructuring units, managements of dead bodies, management of human resources, documentation and evacuation. The

Profession	N	%
Auditor	1	7
Health care	1	7
Hospital Management	4	29
Medical Doctor	3	21
Nurse	4	29
Religious	1	7
Total	14	100.00

Table 2: *Background of participants.*

Years of experience	N	%
1 - 5 years	5	36
6 - 10 years	6	43
More than 10 years	3	21
Total	14	100.00

Table 3: *Years of experience.*

statements that were below 70% related to the need to review and exercise the plan, communication tools, logistics, staff and health security, funds, public information, activation and reporting system and the transfer between hospitals. These statements resulted in some degree of hesitation and were generally associated with a neither agree or disagree and agree.

Concerning the statements related to the organization, the responses were all composed of Strongly agree and Agree statement except for the Hospital Command statement that included one neutral statement (Table 1). The level of Strongly Agree was the highest (93%) for the need of a plan and the lowest (64%) for the need to review the plan statement.

Concerning the statement related to logistics, the responses were all composed of strongly agree and Agree statement except for the pre-establish agreements with suppliers that included a neutral statement. The level of Strongly Agree was the highest (86%) for the need to stock medicines and supplies and the lowest (57%) for the pre-established agreements with suppliers.

In the statements related to media and the information, the responses included the three components: Neither agree nor disagree, agree and strongly agree.

The level of Strongly Agree was the highest for the internal communication (86%) and the lowest (57%) was for the public information.

In the statements related to the HR, the responses were all composed of strongly Agree and Agree except for the need to include Organization and procedure that treat the staff and health facility security during emergencies that included a neutral statement. The level of Strongly Agree was the highest (93%) for Training of staff on disaster plan and the lowest (57%) for the need to include Organization and procedure that treat the staff and health facility security during emergencies.

The three lowest statements for Strongly agree concerned the mechanism of transfer between the hospitals (64%), Organization and procedure for health and the facility safety (57%) and the funds (43%).

Discussion

The aim of this study was to highlight criteria to be included in a disaster plan based on a consensus. However, it was also expected that as many as possible of the criteria proposed could reach the set consensus level of 80%. Consensus was, indeed, reached for all the statements with a high percentage (97%), for the level strongly agree. Since the statements were quite general this was not a total surprise,

although the dominance of strongly agree was more than expected. This could be explained by there were a general awareness of and knowledge of disaster planning in spite of the lack of national guidelines [8].

When we used the first approach, the analysis demonstrated no relation between the variable in the first section compared to the statements in the second section. This finding could possibly indicate that the experience of war and other MCE that most hospitals have lived though, and that seminars organized in these past years on this topic as well as the availability of international publications could have had a general effect on the responding managers. Additionally, this could also have been influenced by the chosen method per se where the questionnaire was developed as a result of the first round.

In the second approach, the study noted that the statements higher than 70% included the organization, food, internal communication and media, logistic system and stocking, restructuring units, managements of dead bodies, management of human resources, documentation and evacuation. The statements that were below 70% related to the need to review and exercise the plan, communication tools, logistics, staff and health security, funds, public information, activation and reporting system and the transfer between hospitals. These statements resulted in some degree of hesitation and were generally associated with a neither agree or disagree and agree.

The statement number three was related to the need to review and revise the plan on a yearly basis. This statement did not receive high score compared to the statement addressing the need to have a plan. This could possibly reflect that the managers may not see the plan as a living and dynamic document but rather merely as a document that they were obliged to have. On the other hand, the need to exercise the plan was evaluated on a separate statement and scored high score too, which indicates that a plan may not be considered valid if not tested. Furthermore, the participants were more positive concerned the need to have some kind of documentation. This is shown in the statements twenty seven and twelve, where participants were more agreeing on the need to have a Job Action Sheet and to document and evaluate the plan after activating it.

The statement number twenty is of special interest because it shows the prioritization in allocating resources compared to the statements number fifteen, sixteen, seventeen, eighteen and twenty eight, that consider resources as medicine, supplies, water, fuel, food and electricity more important than the communication tools. This could be explained by the absence of enough resources to buy and run these resources, in addition to the fact that the usual communication tools are not functional during crisis due to overload. This problem in usual communication could possibly be balanced by the use of sophisticated communication tools like the satellite phones; however, these tools are even very expensive too. These results correspond with the latest report done by the WHO and MoPH on the Lebanese hospital experience in the war 2006 that demonstrated that some elements were stocked and other elements were not stocked and consequently hospitals suffered shortage like the fuel, water and some drugs [13,14].

Related to logistic system, it was noted that the two statements related to this issue (statements number thirteen and fourteen) were not in harmony. The participants were convinced that there is a need to have a logistical system in place for emergencies although they were not so convinced about the pre-logistical agreements. This absence of enthusiasm could be related to the unresolved problem between the hospitals and suppliers. In fact, the origin of the problem is the public guarantors delay on paying to the hospitals which result in a lack of cash-flow in the hospital hands [15].

This issue results in delay in paying the suppliers bills and oblige the hospital to prioritize the needs and limit the possibility to do pre-arrangements with the suppliers when the bills are not paid on time. This could be balanced by the presence of a stock pile in the region as previously suggested [14].

The statement number twenty three relating to the staff and health security did not reach a high percentage of strongly agree (57%) and could be a consequence of the complexity of this issue and the previous experience of the participants in ensuring this vital element. This result also coincide with previously demonstrated findings related to the 2006 war and its consequences to the hospital functioning [13,14]. In fact, the events in 2006 war had not spared the health facility structure, personnel and other health providers like the EMS, who had lost volunteers and workers during their mission [14]. On the other side, hospitals understand the importance of this factor which is in the statement related to the evacuation plan (statement number eleven). The hospitals might not be able to protect its structure and

personnel against external factors; however, the hospital is aware of the necessity to evacuate the hospital when the security of its staff and patients could not be guaranteed.

The statement number twenty one shows that public information was considered a concern for the participants. Communication and information is considered as an important factor in managing disasters [16] and this has been partially approved by the participants. In fact, internal communication was scored high (86% strongly agree); on the other side, media communication was less scored (78% strongly agree) and the lowest score was for the public information (57% strongly agree). This suggests that the participants were aware of the need to have a good internal communication system; however, they might not have the proper knowledge of the importance of public or media communication which previous studies have pointed out [14].

The statement number nine comprising mechanism of transfer between hospitals could be considered as a sensitive issue. As described earlier, Lebanon health system is 80% private, which means that the hospitals look for revenues. Adapting a mechanism of transfer could therefore be seen as a loss of potential revenue. On the other hand, implementing such a mechanism could be difficult in the eyes of the hospital since there is no public agency with overall control of a scene of an accident and thereby coordinating the management and transport of victims to the hospitals. In addition, there are logistical difficulties encountered during the war where resources, accessibility and safety were an issue [13].

The statements number thirty addresses funding which is a critical element in the functioning of the hospital. Despite the participants' opinion in keeping and storing resources, the participants were not generally positive to include the funding in the hospital plan, although funding possibly could guarantee adequate resources when needed. This could be explained by the concern if the hospitals were to include funding in the plan; they may commit themselves to have financial support that may not be available at all times.

The statement number ten is related to the reporting and the activation system. Hospitals in Lebanon generally are not used to have such a system in place and rely on their experiences to manage MCEs. This could possibly be related to the issue of defining what an MCE is. It was noted that the participants did not specify the definition of the MCE and did not tailor it to the hospital, despite including it in the second round of the questionnaire. However, in a different statement related to activation system, need to include activation mechanism (statement number 6), the responses were more than 71% strongly agree, which is only slightly different to the number six statement that had 64%. This suggests that either the low response was due to reporting system and not the activation or misunderstanding it for another issue. Possibly this could be the result of how the statement was formulated and possibly it was interpreted in more than one way.

The statements two, four, five and seven related to organizations have all received high rating of strongly agree, which is comprehensible, since the statements does not have specific criteria and are related to basic, a generally accepted elements for a hospital plan. The last statement in the organization which is the reorganization of the emergency room set up is closely related to two components in a hospital plan: the triage and the surge capacity of the hospital. Studies have highlighted these issues as essential measures when facing MCE [3,17].

The statements twenty four, twenty five and twenty six related to human resources were all homogenous and have all received high score of strongly agree level. This could be a consequence of the shortage that was experienced by the hospital during the 2006 war and one of the lessons learned was to invest and manage these critical resources. This is also coherent with what previously has been demonstrated [13].

The management of dead bodies is also an important issue to deal with in disasters [18]. Despite the fact that dead bodies should not be kept inside the hospital treatment areas and should not consume the hospital resources, this is often the case Organization such as International Committee of the Red Cross (ICRC), Pan- American Health Organization (PAHO) and the United Kingdom home and cabinet office have elaborated manuals on how to deal with fatalities and this is consistent with previous finding that stresses the importance of this issue [19].

Conclusion

- Consensus was reached by on all the statements proposed indicating that there is a general agreement on what should be included in a hospital disaster plan

- The proposed criteria could be used as a guideline for the hospitals in their preparation and for the ministry of public health as a draft document to use.

- The need to have a plan and to train staff on it scored the highest level (more than 90%) this is a result, not a conclusion.

One possible limitation was related to the timing of the survey: The survey was performed both at the time for summer vacation, as well as during the Ramadan period.

Another bias was the design of the questionnaire. Different formulated statements may have resulted in different levels of consensus and thereby could have been more discriminating when finding out what was considered as most important.

Bibliography

1. Arnold J L. "Disaster Medicine in the 21st Century: Future Hazards, Vulnerabilities, and Risk". *Prehospital and Disaster Medicine* 17 (2002): 3-11.

2. EM- DAT. "The International Disaster Database". Centre for Research on the Epidemiology of Disasters (2009).

3. Hoyle JD. "Healthcare Facility Disaster Management". Koening and Schultz's disaster medicine: comprehensive principles and practices. Cambridge University Press. New York (2010): 285-311.

4. World Health Statistics. WHO (2011).

5. Ammar W. "Health System and Reform in Lebanon". Provision of Health Services. Entreprise Universitaire d'Etudes et de Publications. Beyrouth (2003): 11-26.

6. Harb H. MoPH Statistical bulletin. MoPH Statistical unit (2009).

7. Arbid B. "Responding to Disasters". *Health and Human Magazine* 13 (2010): 37-41.

8. UNDP Lebanon. "Strengthening Disaster Risk Management Capacities in Lebanon" (2009): 1-29.

9. Ammar W., *et al*. "Accreditation of hospitals in Lebanon: a challenging experience". La Revue de Santé de la Méditerranée orientale (2007): 13.

10. Hsu CC and Sandford B. The Ohio State University and Oklahoma State University. The Delphi Technique: Making Sense of Consensus. Practical Assessment, Research and Evaluation 12 (2007): 10.

11. Strengthening health system's response to crisis. A toolkit for evaluating health systems' capacities for crisis management. WHO Regional Office for Europe. European Commission. Copenhagen (2011).

12. Hospital preparedness checklist for pandemic influenza. "Focus on pandemic (H1N1) 2009". WHO Regional Office for Europe. Copenhagen (2009).

13. Lebanon Crisis. Service Availability Assessment. WHO. MoPH (2006).

14. Ammar W. "Health System and Reform in Lebanon. Characteristics of the Market". Entreprise Universitaire d'Études et de Publications. Beyrouth (2003): 55-60.

15. Syndicate of hospitals in Lebanon (2008).

16. Mass Casualty Management Systems. Strategies and guidelines for building health sector capacity. WHO. Geneva (2007).

17. Ruthven D. "The Interactive Medical Emergency Department: Architectural Integration of Digital Systems into the Emergency Care Environment" (2007): 1-246.

18. Management of Dead Bodies in Disaster Situations Disaster. Manuals and Guidelines Series, Nº 5. PAHO, WHO (2004).

19. Sledzik P and Bryson S. "Mass Fatality Management. Koening and Schultz's disaster medicine: comprehensive principles and practices". Cambridge University Press. New York (2010): 312-325.

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