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Disaster Preparedness Attributes and Hospital's Resilience in Malaysia

Nor Malyana Samsuddin[a]*, Roshana Takim[a], Abdul Hadi Nawawi[a], Sharifah Nur Aina Syed Alwee[a]

[a]*Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA (UiTM) 40450 Shah Alam, Selangor, Malaysia*

Abstract

Disaster resilience hospital (DRH) is the hospital's ability to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner. DRH includes the preservation and restoration of the hospital's essential basic structures and functions. Resilience (i.e. robustness; redundancy; resourcefulness; and rapidity) could be achieved through enhancement of preparedness attributes in terms of structural, non-structural and functional measures. However, over the past few years there is a growing body of evidence to show that the impacts of disasters are affecting negatively towards public hospitals in Malaysia. It is believed that to a certain extent the preparedness attributes of hospitals towards disaster resilience are insufficient. Hence, the purpose of this paper is twofold: to investigate the hospital preparedness attributes and resilience indicators; and to establish relationship of preparedness attributes towards hospital's resilience. Cross-sectional survey was conducted among twenty six (26) Malaysian hospitals' staff. A total 243 preparedness attributes (structural- 21; non-structural-107; and functional-115) and 23 resilience indicators (robustness- 5; redundancy-5; resourcefulness-6; and rapidity-7) were subjected to non-parametric Spearman Correlation. The results revealed that 17 preparedness attributes and 23 resilience indicators are rated 'very critical' by the respondents by which human resources & training and ability to adapt in a timely manner are ranked first. In addition, non-structural preparedness presented greater strength of correlation towards robustness; redundancy; and resourcefulness. On the contrary, the functional attributes showed higher correlation towards rapidity. The results could serve as indicators for the public hospital's stakeholders in Malaysia to improve its preparedness and enhancing its resilience.

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Keywords: disaster resilience hospital; disaster preparedness attributes; Malaysia; quantitative

* Corresponding author. Tel.: +60193670529
E-mail address: malyanasamsuddin@gmail.com

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1. Introduction

The issues of preparedness measures in achieving hospital disaster resilience have been discussed for more than 30 years across the globe. In 1981, the World Health Assembly passes a resolution that state "*despite the undoubted importance of relief in emergencies, preventive measures and preparedness are of fundamental importance*". In addition, the International Decade for Natural Disaster Reduction (IDNDR) was launched with ten year plan (1990-1999) with further resolutions on the *importance of preparedness in health sector* [1]. Furthermore, Hyogo Framework for Action (2005-2015): Building Resilience of Nations and Communities to Disasters are presented, by which under the Priority Four – reduce the underlying risk factors, the action is promoting the goal of "*hospitals safe from disaster*". The purpose of the initiative is to ensure that all new hospitals are built with a level of resilience, remain functional in disaster situations and implement mitigation measures to existing health facilities.

Since then, the campaign for Safe Hospital has gaining its prominence over the years. As such, World Disaster Reduction Campaign on Hospitals Safe from Disasters (2008-2009); Global Platform in 2009; and ten-point checklist for Making Cities Resilient campaign-My City Getting Ready in 2010 account the safety and resilience for health facilities. In 2011, Malaysia commits to maintain the safety 3,231 hospitals, including clinics under the 2011 Global Platform on Disaster Risk Reduction. Latterly, disaster resilience hospitals outcome have been highlighted for Priority 1, 3 and 4 of Sendai Framework for Action (2015-2030). It is supported by Geroy and Pesigan [2] by which the stakeholders should cooperate in making the hospital strong, reliable and resilient due to the fact that the hospitals are frequently damaged and operations are affected in times of extreme events. However, recently one of public hospital in Johor has caught on fire and six fatalities were recorded. It is believed that it was caused by a burnt capacitor of the ceiling lights and flammable materials under the lighting. It shows that the safety of the *non-structural components* (electricity) is being neglected. Due to the burnt capacitor, it has led to greater event which has triggered fire to the *structure* of the ICU building that caused to fatalities. The disaster response and evacuation *(functional)* were made more difficult due to the rapid fire throughout the area. It could be inferred that those attributes (i.e. structural; non-structural; and functional) are essential in ensuring hospital's resilience. Hence, the objectives of this paper are twofold: to investigate the hospital preparedness attributes and resilience indicators; and to establish relationship between preparedness attributes and hospital's disaster resilience.

2. Hospital Disaster Preparedness Attributes

Disaster preparedness refers to *measures* taken to prepare for and reduce the effects of disasters. That is, to predict and, where possible, prevent disasters, mitigate their impact on vulnerable populations, and respond to and effectively cope with their consequences [3]. Federal Emergency Management Agency (FEMA) [4] defines preparedness as "a continuous cycle of planning, organising, training, equipping, exercising, evaluating, and taking corrective actions in an effort to ensure effective coordination during incident response." According to United Nations New York and Geneva [5], preparedness are the *knowledge and capacities* developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters. Given the above, hospital disaster preparedness refers to measures taken by the hospital's stakeholders in terms of planning, organising, knowledge training, equipping, exercising, evaluating and taking corrective actions to prepare, reduce the effects of disaster and ensure effective coordination during incident response.

Table 1 shows eight (8) existing hospital preparedness assessment instruments that have been implemented by international agencies and past researchers. In that assessment, three preparedness attributes (i.e. structural; non-structural; and functional) are considered as utmost critical.