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A studyto determine the capabilities of rural hospitals in Sichuan Province to respond to the pandemic.

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Abstract

The area of public health emergency preparation is still developing even though it has been reacting to crises for a long time. The advancement in public health preparation is frequently stagnant due to a lack of consensus on the issue and agreed-upon criteria for disaster response and readiness. In light of the existing literature, we can deduce "that it's difficult to make such improvements due to a lack of ability to objectively measure public health emergency preparedness (PHEP). This is due primarily to a lack of consensus on the definition and key elements of public health emergency preparedness".

It is the goal of this study to establish a technique for assessing public health readiness and to use that information to motivate action. This study aimed to establish and evaluate a complete assessment methodology and to create "and test a standardized index to quantify hospital PHEP" in order to generate reliable and valid preparation measures. This study utilized a mix of qualitative and quantitative techniques. The qualitative research involves a thorough literature analysis, in-depth interviews with important experts, and a modified Delphi technique to transition to an accepted framework. As a consequence of the qualitative research, an evaluation instrument (questionnaire) was designed and used in "a cross-sectional survey of hospitals in Sichuan Province, China" for the quantitative study.

Keywords: R"ural hospitals, Public Health Emergency, Preparedness, Evaluation"

Introduction

Emergencies in public health have a direct impact on the well-being of the population, as well as the economy and social order. A string of public health catastrophes has tested "government agencies, hospitals and clinics, public health organizations and university researchers throughout the world's preparedness and response capabilities in the last decade.

Each of these occurrences has put public health services to the test and had a direct influence on the health and well-being of those who were touched. For example, the SARS outbreak not only put pressure on the health care system's response capabilities, but it also had a direct impact on the profession's ability to operate as a whole. Even though it is presently affecting a limited number of individuals, H5N1 influenza (Bird Flu) carries a significant death rate and has the ability to spread from person to person. There are several examples of how a threat to public health can take on many different forms due to natural catastrophes, such as earthquakes in Haiti, China, and Pakistan in 2010. When public health safeguards like sewage systems, clean water sources, and safe food are destroyed, the death and morbidity that results can be staggering.

Resilient health systems may be characterized as those that are capable of preventing, mitigating, preparing for, responding to, and recovering from the consequences of PHEPs. Maintaining a hospital's emergency readiness is a never-ending task. Preparation for big crises differs from normal hospital duties because emergencies occur abruptly and frequently without warning. Nevertheless, assessing hospitals' catastrophe preparedness is done under ordinary stress rather than non-routine stress.

Under such extreme conditions, it's impossible to foresee how hospitals will function. As a result, any judgment must be based on the stages of crisis management. In order to create a dynamic framework, you need to create an organizational system and structure, go through your resources, train employees, and test and improve your service. The World Health Organization (WHO) and many other governments have

implemented systems and institutions to protect people's health and well-being in response to such risks. More and more, surveys are being used to gauge a community's readiness for different calamities. To better fulfil the primary objective of preparedness: avoiding injury and sickness, disability and death, and supporting recovery, information created via well-designed and well conducted research is important.

Hospitals play a critical role in delivering timely and uninterrupted health care to the public during and after disasters ("Barbara I. Braun, et al. 2006). Additionally, hospitals" are critical for people in charge of devising strategies for averting and treating large-scale epidemics of infectious illness and other catastrophic catastrophes (Niska, Shimizu. 2011). For this reason, China's government has made significant "investments in public health infrastructure on a state and local level and has allocated funding to audit hospitals" to determine their readiness for responding "to public health emergencies (Qi Zhao, 2009; LQ Liuet al., 2006").

Nevertheless, current study has concentrated on places with abundant people and material resources, such as health care facilities in provinces and municipalities. Chinese emergency features show that public health emergencies are more likely to strike rural and isolated communities. Because of this, "rural hospitals may be the first significant response capacity for public health emergency responses and management (Hu GQ 2006"). More than 60% of the population lives in rural areas, while only 20% of the country's health resources are located there (Qi Zhao, 2009). The proximity of possible terror targets, international boundaries, and the availability of food and water in rural areas might provide new problems for rural health care facilities.

Literature Review

There are always dangers to the public's health. Threats to public health can arise from a variety of sources, including natural disasters, accidents, or deliberate acts. Hospitals play a critical role in delivering timely and uninterrupted health care to the public during and after disasters. The necessity of hospital readiness has been highlighted for preserving and ensuring the public health of a nation. Being ready to avoid, respond, and quickly recover from public health risks is important.

"All hospitals should have established emergency plans, beds, medications, and equipment, as well as qualified and educated staff to respond to any public health emergency(Loutfy MR, Wallington T, Mederski B, et al. 2004").

We are just beginning to look into how hospitals might better prepare for public health emergencies. To provide one example, there are no universally acknowledged, standard concepts or conceptual frameworks for the study to be structured around (XiaoPingGao 2010).

After defining hospital public health emergency preparation, this section examines the common themes associated with the notion of hospital public health emergency preparedness. So it's the starting point for creating an evaluation system that everyone agrees on.

The literature study focuses on the following four research topics after exploring the definitions of a hospital's preparedness: (1) What does it mean to be prepared for a public health emergency? Is there any existing technology that can help hospitals better prepare for emergencies? What commonalities, if any, do the selected instruments have that may be used to assess hospital readiness? What conceptual framework should be used to synthesize these important elements into the idea of hospital preparedness?

This section "used a meta-ethnographic method to synthesize information from included research to address these concerns. As a well-developed technique for synthesizing qualitative health research, this meta-analysis" communicates ideas, concepts, and metaphors across studies.

It also includes "four distinct phases: (1) a thorough literature search to identify relevant articles; (2) a

critical appraisal of the identified articles; (3) development of a comprehensive definition for public health emergency preparedness in hospitals; and (4) a subsequent meta-analysis to identify consensus elements for high levels of preparedness to advance the development for a universal self-assessment tool".

Once significant research had been located, snowballing methods were employed as well. We checked the indicated papers' important references, citations, instrument names, and authors to make sure that everything was there. The focus was on peer-reviewed journal publications that were close to the hospital PHEP assessment tool.

Qualitative studies concentrating on tools for assessing or evaluating hospital readiness or "related concepts in the event of public emergencies were included in the" review. They employed qualitative methodologies. There were papers reporting purely qualitative research, as well as papers reporting qualitative findings from mixed methods research. The search was restricted to English- and Chinese-language journal publications. Articles were chosen based on inclusion and exclusion criteria set at four levels. When it comes to hospital readiness, we looked at research that utilised qualitative approaches and focused on instruments to measure or evaluate it. Only qualitative research was included, as were studies that used qualitative and quantitative methodologies (a mixed method). Books, reports, and conference abstracts were omitted from this review in order to get authoritative information. There was no consideration of hospital readiness in the research; only community preparedness, staff preparedness, and individual preparedness were considered.

Research Gap

Research shows "that there is no accepted paradigm for understanding or measuring the components of health system resilience, as this review" shows.

Attempts have been "made in metropolitan regions, but rural areas have received less attention. The Xufeng et al. study in 2010 created a framework for assessing community hospitals' capacity, while Shenjinyu (2011) used expert consultation and literature research to create a CDC "capability index." The preparedness capacity for urban PHE was evaluated by Shenjinqiang (2011). Research on military hospitals and the current state of special hospital readiness capability has also been conducted by others" (Qiu XY 2007; Lv HY 2005; Lin YF 2007; Yang XY 2008; Wang ZH 2008).

Rural public health emergencies are common, and county hospitals are the most effective first responders in "these situations (Hu GQ 2006). As a result, counties in high-risk rural China need to be investigated and assessed for their readiness and response. In addition, health system resilience measures must be developed and evaluated. Scholars produced most assessment tools, but they lacked comprehensiveness" and rigour, and some surveys' validity and reliability were never evaluated (Zhu, et al. 2006).

It was found that some organisational factors influence the organization's response to PHE, but Zhao Qi et al. (2009) "suggested that a system of assessment indicators needs improvement. Zhao Qi et al. assessed the county-level public health emergency response systems in six Chinese provinces in 2009. Data was gathered mostly in 2005-2006, during the early stages of the PHE system's development. The present" state of preparation must thus be known.

Using an evaluation instrument adapted from previously used instruments and further refined by experts' input, this study seeks to evaluate rural Sichuan Province hospitals' PHE preparation capability in order to remedy these issues. The study will look at how prepared people are and identify the variables and barriers that stand out as having the greatest impact on how well they are prepared.

Research Objective & Methodology

Relevant aspects of hospital readiness determined through a comprehensive literature research were utilised in this study to construct a draught framework as the foundation for structured interviews with key experts, which formed the basis for the study's findings. Detailed interviews were performed to add to and confirm the literature review's findings about hospital readiness.

The experts to examine the parameters of hospital public health emergency preparedness evaluation were identified using a purposive sample approach.

Structured interviews have a range of participants and key informants of 10 to forty. There were 15 participants in all from academic institutions, administrative organisations, and technical institutes that took part in this study.

Step 1's goal was to sort specialists into categories so they could be more easily identified in step 2. Academic institutions, administrative organisations, and technological institutions all have experience with catastrophe management concerns, which were studied in depth as part of this study. The names of possible experts were sorted into categories once step 1 was finished. The next stage was for the researcher to get in touch with all of the possible specialists and ask for recommendations for others. Step 4 involved comparing and prioritising the qualifications of experts in each area. The final stage was creating a panel based on the rankings.

Data Analysis & Findings

According to literature review thorough examination, twenty-three subthemes emerged from the assessment of the literature, and these themes follow a cyclical pattern from pre-event planning to incident management to recovery or adaptation following the incident itself. As a result of these themes and subthemes, a draught framework for disaster management was created and verified through a series of in-depth interviews with leading experts.

This part of the survey had a diverse group of people who had varying levels of experience. Two "consultants from the Sichuan Health Bureau, directors or managers from the CDC (3) and hospitals were amongst the fifteen experts chosen in accordance with the criteria outlined above. Four of the professors in disaster management were from universities (including the Queensland University of Technology and Sichuan University) (6). They were" all high-ranking members of their respective organizations with at least five years of expertise in their respective fields.

Participants were contacted by phone or email and completed a permission information sheet prior to the interview taking place in China's Sichuan region. When participants were in Sichuan, face-to-face interviews were performed; otherwise, interviews were conducted over the phone or through webcam.

Records "were manually transcribed and organized into major themes and concerns once the interviews were completed. Data was deconstructed, theorized, and" classified throughout this procedure, and related incidents, claims, and discursive practices were collected and organized.

The in-depth interview was focused on answering two key questions:

(1) Are hospitals prepared for an emergency in terms of components, contents, or elements?

(2) What was the expert's take on the problems faced by large hospitals in rural China in terms of public health emergency preparedness? For example, hospital culture and societal views, disaster management policies and plans, management mechanisms and processes, preparatory expenses, governance frameworks, and socioeconomic frameworks).

Hospital PHEP conceptual model was built using a collection of basic parts. It was found that sustaining a

high level of PHEP necessitates a model that incorporates five core metrics: people, stuff, service, space, and system. Their design was based on catastrophe management stages (pre-, during incident, and post-). PHEP actions are described in the model, which connects together hospitals' key emergency preparedness skills to help them "prepare for, respond to, and recover from public health" catastrophes.

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Nine "key components made up the final, validated evaluation framework, including an emergency plan, PHE detection and identification, laboratory diagnosis capacity, training and drills, communication and cooperation, medical treatment capacity, a command system, and fully staffed staff members of the workforce. Once the framework had been tested and examined, a survey of rural Sichuan hospitals was conducted to determine the present state of hospital PHEP in the province (China). By utilising the Factor Analysis method and creating a statistical model" ($F=0.518F1+0.173F2+0.160F3+0.150F4$), "four major contributing factors were identified that primarily affect hospital PHEP, namely the hospital service capacity factor, human resource factor, stockpile and facility factor, and the management, direction, and coordination (MDC) factor".

Most rural hospitals in Sichuan province were found to be capable of responding to public health crises, "although there are still a number of problems and inadequacies. It was also shown that tertiary-level teaching and general hospitals fared better than secondary-level (nonteaching) and general hospitals (non-general) when" comparing preparation capacity using these four variables.

Conclusion

An in-depth analysis and description of hospital PHEP is provided in this study, and it validates the essential aspects of hospital PHEP that may be utilized to build new research surveys or improve present tools. With the newly suggested and verified framework, hospitals will have a useful tool for better analyzing PHEP activities and making investment decisions for PHEP in hospitals with an eye toward achieving long-term goals. "Pre-planning, coordination, quality improvement, and health service improvement will be facilitated, as will the efficacy of training and exercises, as well as the prioritization of resources. Additionally, the framework may be used to develop" strategies and plans to improve hospital preparation and performance.

Limitations must be acknowledged. The study only included 46 hospitals, so there's a good chance that selection bias influenced the results. Using a self-report approach, bias in respondent reporting is possible. In addition, the study lasted for over a year, during which time the PHEP of the hospitals examined may have changed.

To build on this study's conclusions, more research is required. To make sure it works, the framework should be tested across provinces as well as in other countries and jurisdictions. More objective metrics of hospital performance during public health emergencies should be compared as well. Practical recommendations and tools that can promote progress should also be a focus of study, as the goal is to guide readiness and reaction.

There should be more effort made in China's hospital "PHEP research in the future to: (1) establish an internationally accepted standard of prepared PHEP; (2) create a theoretical framework for future studies; and (3) integrate research from different disciplines. This standard should be accepted by policy makers

and stakeholders alike, especially those charged with assessing the public health and safety systems' capacity. Because of this, academics should focus on the foundational ideas" and techniques of public health events and catastrophes, as well as the critical functional systems needed to improve hospitals' emergency preparedness.

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