

# **A COMPARISON OF HOSPITAL RISK MANAGEMENT STRATEGIES UNDER SARS AND COVID-19**

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## **ABSTRACT**

*This study explores the methods of hospitals use in taking to implement response measures from the perspective of epidemic crisis management. We analyze the practical experience of each hospital, the crisis situation, the countermeasures, and the review of the hospital's rehabilitation methods. This research utilizes a case study method. Interviews, internal hospital file data, and related journal articles and media reports are the main sources of research data. This research explores organizational behavior of the hospital and the strategic emergency points that it showed in the face of crisis. We examine the "transformative" leadership style uses timely and application-oriented management. We observe that implementation of epidemic prevention measures and response methods have gradually embarked on the right path from chaos. Faced with a shortage of anti-epidemic materials, hospitals have been working hard to deal with risk management. Based on these findings, this research provides some policy implications for hospitals to mobilize and respond to similar viral diseases in the future.*

**JEL:** I18, G32, G34

**KEYWORDS:** Novel Coronavirus, Risk Management, Transformational Leadership

## **INTRODUCTION**

In 2003, severe acute respiratory syndrome (SARS) broke out. The epidemic has caused 664 possible SARS cases in Taiwan, including 180 deaths. The painful experience of SARS delivered a heavy blow to Taiwan's public health system until December 31, 2019. The Taiwan Centers for Disease Control and Prevention (CDC) confirmed the new coronavirus epidemic to the CDC and World Health Organization (WHO). The Taiwan Executive Yuan held an interministerial meeting on disease quarantine and maintenance. The WHO announced the discovery of a new virus and named it the 2019 new coronavirus. Taiwan's disease control department listed the new type of coronavirus pneumonia, namely, "severe special infectious pneumonia," as the fifth category of statutory infectious diseases. On January 21, 2020 a new case of coronavirus infection appeared in Taiwan for the first time, and Taiwan's "Central Epidemic Command Center" was upgraded to level 2. On February 27, 2020 the Taiwan Epidemic Prevention Command Center was upgraded to level 1. On March 11, 2020 the WHO officially announced that the new coronary pneumonia had entered to "global pandemic."

The spread of emerging infectious diseases may only increase with the era of globalization. According to statistics on the WHO website on October 1, 2020, the coronavirus disease 2019 (COVID-19) epidemic has affected 187 countries and regions worldwide. In addition, according to statistics from Johns Hopkins University in the United States, there have been more than 33 million confirmed cases worldwide. As of October 1, 2020, Taiwan has confirmed 517 cases, and 7 deaths.

The current new coronavirus reappeared after the huge impact of SARS. The study suggests that to maintain the personnel health and safety in medical institutions, risk assessment should be carried out for the working environment or operational hazards of medical institutions. However, since possible hazards should be identified, as the basis for risk assessment, safety and health practices with reduced risks should be adopted (Zhu and Zhang, 2020). Taiwan effectively cuts off the chain of disease transmission through strict community defenses. Related measures include strengthening the notification of suspected cases, launching an expanded community surveillance program, early detection of confirmed cases, and subsequent isolation treatment to keep track of the status of cases (Xu, 2020). In fact, hospitals have had more than 10 years of experience in dealing with this disease. The hospital's medical staff did medical work when they faced the virus outbreak. Whether it is sufficient for the patient's infection control ability and self-protection ability will be tested in time.

In combating infectious diseases, Taiwan has always taken the Infectious Disease Prevention Law as the main normative basis. To effectively deal with such serious contagion and serious threats to people's lives and health, it made changes to the text after facing the painful lessons of the SARS epidemic. As an administrative worker in a hospital, this study can explore how epidemic hospitals in the community can use effective measures to deal with mission-based crisis.

An earlier version of this paper was presented at the Japan International Business and Management Research Conference. The earlier version was published in Proceedings of Japan International Business and Management Research Conference, RSF Press & Research Synergy Foundation, Lee and Weng (2020). The rest of this study is organized as follows: in the literature review part, the relevant research are mainly introduced. The research method section describes the data and defines the content of the interview. In the results and discussion section, the study provides specific comments on the results. The conclusion section contains some closing remarks.

## LITERATURE REVIEW

### Novel Coronavirus

Coronavirus is a virus with an envelope. The symptoms of the new coronavirus infection are more serious than those of the general coronavirus, and some cases may produce severe pneumonia and respiratory failure. Temporarily, the WHO named it the 2019 new coronavirus. At present, the complete transmission route of the 2019 new coronavirus is not yet fully understood. Fever and limb weakness are currently the clinical manifestations of the new known cases of coronavirus infection. Respiratory symptoms are mainly dry cough, with some people having difficulty breathing. Severe cases may develop severe pneumonia, respiratory distress syndrome, multiple organ failure, or shock. According to current epidemiological data, most patients can recover, but there are also deaths. Most deaths have underlying medical history, such as diabetes mellitus, chronic liver disease, renal insufficiency, and cardiovascular disease.

COVID-19 data so far indicate that 80% of infections are mild or asymptomatic, 15% are severe infections that require oxygen, and 5% are severe infections that require ventilation. The proportion of severe infections is higher than the proportion of influenza infections. Children, pregnant women, the elderly, people with chronic diseases, and the immunosuppressed are most likely to be infected with severe flu. Our current understanding of COVID-19 is that old age and underlying diseases increase the risk of serious infections. The mortality rate of COVID-19 seems to be higher than that of flu, seasonal flu in particular. Although it will take some time to fully understand the true mortality rate of COVID-19, our data so far indicate that the original mortality rate (the number of reported deaths divided by the number of reported cases) is between 3% and 4%, and the infection mortality (the number of reported deaths divided by the number of infections) will decrease. For seasonal flu, the mortality rate is usually <0.1%. However, the mortality rate depends largely on the extent and quality of medical services.

Risk Management

Risk management refers to how an enterprise can minimize risks in an environment where risks are certain. Risk management refers to the management method that selects the most effective way through the understanding and measurement and analysis of risks and deals with risks proactively, purposefully, and planned and strives to obtain the greatest safety guarantee at the lowest cost. Zhao (1998) argues that risk is the “probability” of a disaster occurring within a certain period of time. Kasperson (1985) suggests that risk refers to the probability of a certain consequence of a certain technology or activity over the years. The Webster’s Dictionary says that a crisis is a turning point and a deteriorating watershed. It is a decisive and critical moment and is also a moment of life and death. It is an unstable period of time and an unstable state that forces the parties to make a decisive change. In short, a crisis is facing a major and critical state of danger, forcing people to make decisions and deal with them in a short time. Lerbinger (1997) points out that, from the perspective of corporate management, the definition of a crisis is an event that threatens the company’s future growth or survival. It has the following characteristics: (1) Managers are aware of threats that may hinder the future development of the organization. (2) Managers realize that the consequences will be very dangerous if no action is taken to solve the problem. (3) The crisis occurs suddenly and is unprepared.

Hermann (1969) pointed out that the occurrence of a crisis is inevitable when three conditions are met: (1) Managers feel threatened and realize that this crisis will hinder the achievement of organizational goals. (2) Managers understand that the situation will continue to deteriorate or become even worse if no action is taken. (3) Managers are faced with a situation that suddenly occurs. Using Hermann’s view to compare the situation of hospitals facing home quarantine of medical staff, we can better understand the “feeling” of the hospital brought by the “crisis,” because it is facing quarantined people who are not sure whether they are infected, and the infection control operating guidelines must also be compared with the care specifications for the infected person. If it is not handled properly, the outbreak of nosocomial infection will make Taiwan’s handling of the epidemic more difficult, and it will be fatal to the survival of the organization. Zheng (2016) mentioned that risk has five characteristics: Objectivity, Universality, Harmfulness, Inevitability, and Variability. Risks include internal environmental risks and external environmental risks. Internal environmental risks include financial, working environment, personnel, and accident risks. External environmental risks are risk medical institutions cannot control, such as SARS in 2003 or COVID-19 in 2020. Wang and Xu (2018) pointed out the risks that may occur in hospitals also include financial management risks, human resources risks, hospital reputation risks, quality management risks, and natural disaster risks.

Risk management is a systematic process whose purpose is to reduce losses caused by the occurrence of risk accidents; in this process, reasons and effects that are not conducive to the product or system can be measured (Yang, 2011). Risk assessment includes the results of risks and the probability of these results occurring (Wu, 2017). Broder and Tucker (2011) suggest that risk represents the uncertainty of property loss, the difference between actual and expected results, and the possibility of loss. They clearly divide risk into three parts: human resources, property and legal liability, and aim at the loss of human resources and property caused by legal liability. The biggest feature of risk management is to make a comprehensive inspection and review of the medical operation process, avoid the occurrence of abnormal events, assist medical managers in the priority of handling problems when facing problems, and improve the unit's system and operation process basis. Also, implementing new forms of governance regulation for greater control, use of knowledge and corporate responsibility (Van Erp, 2017; Carter et al., 2019; Lai, Panfilo, and Stacchezzini, 2019).

Hospitals face higher disease risk no matter whether it is the SARS virus in 2003 or the new coronavirus in 2019. Generally speaking, it is impossible to completely isolate nosocomial infections in hospitals and the ability to treat infectious virus patients depends upon (1) sufficient equipment (negative pressure isolation

ward, protective clothing, and masks), (2) sufficient manpower (infectious doctors and nursing staff), and (3) perfect isolation measures, such as monitoring of fever patients, handling procedures, and evacuation mechanisms. Although district-level hospitals do not have good medical manpower, equipment, and technology, they need to regularly monitor the status of nosocomial infections and formulate infection manuals. Further, infections and suspected infections require isolation. The patient is hospitalized for isolation, the contact adopts the home isolation policy, and the health authority is notified to evacuate in time.

### Transformational Leadership

Traditional leadership theory is based on the balance theory, behind which is the expectation theory and the fairness theory. Influence comes from the leader's ability to make subordinates believe that contribution and compensation are fair and reasonable. The subordinates' obedience and loyalty to the leader are also based on the exchange of reciprocity. In 1978, for the first time in his classic book "Leadership," Burns (1978) put forward the concept of "transformational leadership." He divided political leadership into two types, according to the characteristics of leadership: transformational leadership and transactional leadership. This classification method of transformational and transactional leadership is currently in use.

Under the transformational leadership behavior model, leaders use methods such as dissemination of values to stimulate employees' motivation to work and meet their high-level psychological needs. Transformational leaders use their own behavior as an example to guide subordinates' behavior changes, while focusing on the individual needs of subordinates and strengthening the interaction among members of the organization. In contrast, an atmosphere conducive to team change is created through the cocreation and promotion of the organizational vision and mutual promotion and satisfaction of needs through subordinates and leaders, so that employees can devote themselves to work and ultimately achieve organizational goals. Bass (1985), Bass and Avolio (1990) and Bass and Riggio (2006) elaborated on the difference between transformational leadership and transactional leadership from the perspective of hierarchy of needs. They believe the main reasons for the two leadership styles are different sources of demand motivation. Transactional leadership is mainly performed through external demands such as expectations and rewards, whereas transformational leadership is maintained by stimulating internal motivation of employees (Bass and Avolio, 1990). Transformational leadership is specifically manifested in the following four behaviors: the personal charm of the leader, the motivation of vision, the inspiration of intelligence, and the personalized care (Bass and Avolio, 1994). This also constitutes the four dimensions of transformational leadership variables.

In recent years, changes in the medical environment have brought extremely severe challenges and tests to hospital managers. Therefore, for transformational leaders, how to effectively motivate team members to make employees better, perform tasks faster, and have a higher degree of engagement has become a very important research topic in organizational development. It can be seen from management practice that, in addition to innovation, the choice of organizational strategy, the quality of the members, and the design of the organizational system and the success or failure of an enterprise are direct. There is a decisive influence on organizational effectiveness (Brown, 1991; Yukl, 1994). Robbins (1996) found that, after a comprehensive study of relevant research, many scholars argue that leadership style has a significant impact on the work effectiveness of their subordinates. That is, leadership style is an important factor that can affect the overall effectiveness of the organization.

Burns (1978) and Bass (1985) suggest that, through various motivating leadership behaviors, the forward-looking vision, and personal charisma of transformational leaders could adjust the mentality of their subordinates in a subtle way. Subordinates mutually raise each other to a higher target level to obtain performance beyond expectations.

## DATA AND METHODOLOGY

This study aims to explore how regional hospitals can use effective actions to deal with organizational behaviors in response to community-based epidemic tasks and to respond to crises. It is difficult to identify the causal relationship among different variables through the inference of research hypotheses because the hospital strategy and development process are dynamic. The viewpoint based on the case study assumes that human experience knowledge is constructed through interaction between humans and society. By identifying the existence of objective commonality in things in human experience, it is possible to quantify human experience and verify it through statistical methods. (Zhang, 2004). Therefore, we used a case study method to explore individual hospitals in response to the epidemic and obtain new perspectives. As the basis for the verification of strategic hypotheses, the interviewees could appropriately answer this research question. In recent years, in the field of management and strategy research, Eisenhardt and Graebner (2007) advocate case studies as a method of generating and testing theories, which seems to be favored by scholars. For example, Mintzberg (1973) interviewed managers to understand the nature of management itself and then established the theory of the role of managers based on the interview data and the types and nature of management activities, and the theory continued through interviews and questionnaires. Therefore, the case study is a qualitative study and seeks answers to questions based on the researchers' past experience. Pettigrew et al. (2001) suggest that the organizational transformation is no longer a simplified relationship between independent variables and dependent variables, but an interactive relationship between the context and activities on the time axis. Therefore, this case study is obviously more complete and structural and is sufficient to strengthen the lack of cross-sectional research.

This study selects a regional hospital in New Taipei City as the research object. It is based on a traditional private hospital of more than 20 years. Under the guidance of its vision, it has drawn up business directions in different periods to seek growth and continues to cooperate with the local community culture and economy. Social interaction is like a microcosm in the history of the development of community hospitals in Taiwan. Therefore, the growth process of the hospital is the research object of this study.

The data sources in this study are divided into primary and secondary data. Secondary sources include texts related to the institute, for example, hospital turnover, number of outpatients, and number of employees. In addition, on September 14, 2020, a face-to-face interview with the dean of the hospital from 10:00 to 12:00 and a one-hour interview with the former convener of the emergency response plan at 15:00. The actual interview questions in this study focused on convening the prevention and control meeting of the visited hospital in the face of the epidemic, the formulation of epidemic prevention policies, relevant epidemic prevention training, epidemic prevention supplies, task communication, and the discussion of the reward and punishment system during the epidemic prevention period. It can improve the validity of this study and confirm whether the direction of the hospital's response strategy for more than two decades is consistent with the hospital text to increase the reliability of this study.

## RESULTS AND DISCUSSION

This study mainly examines the impact on people during the January to August 2020 epidemic and aims to consider the medical treatment in the same period in 2019 as a comparison to understand the changes in people's medical treatment in 2020. The main research purposes include (1) looking at the overall medical utilization status and trends before and after the novel coronavirus epidemic; (2) exploring whether the changes in medical utilization are an epidemic caused by the perceived risk based on the changes in the number of relevant news reports and suspected cases reported during the novel coronavirus; and (3) understanding the medical changes caused by the impact of the individual hospital on the new coronavirus.

First, the impact of the new coronavirus on medical utilization and overall trend. Changes in the number of medical visits during the new coronavirus epidemic are shown in Table 1. We first use the research samples

in 2019 and 2020 and the average number of medical visits in each month to show the trend of medical utilization changes. The average number of medical visits per month is 3,529 in 2019 and 3,010 in 2020. The number of medical visits in 2019 was slightly higher than that of the same period in 2020, and a significant decrease was found in 2020, which could reflect the epidemic. As of February, the number of medical visits in the month of 2020 began to be lower than in 2019, and the two-year gap reached the largest in April. It was not until July that the number of medical visits in 2020 rose back to higher than the same month in 2019.

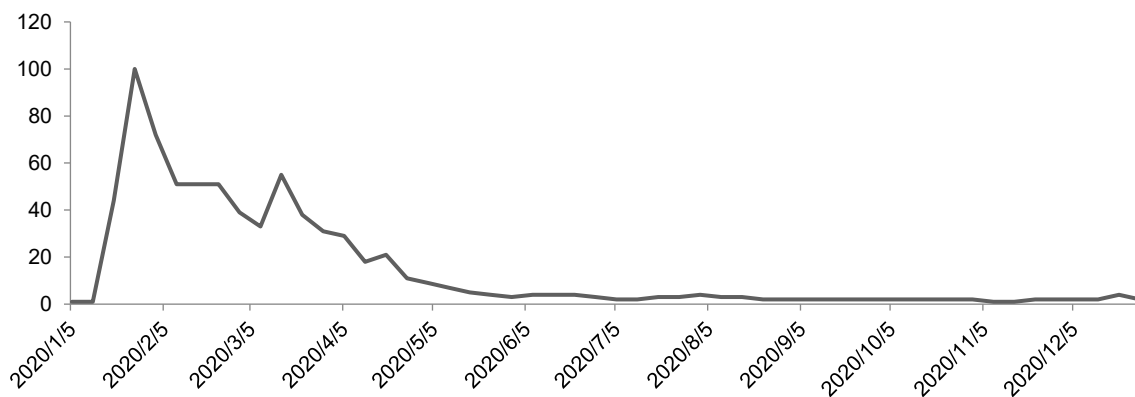
Table 1: Number of Outpatients in Hospital

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2019	3706	2898	3575	3578	3619	3353	3530	3569	3447	3654	3593	3820	3529
2020	3215	2820	3010	2760	2802	2852	3171	2980	2819	3668			3010

*This table shows the number of outpatients in the hospital for 2019 and 2020.*

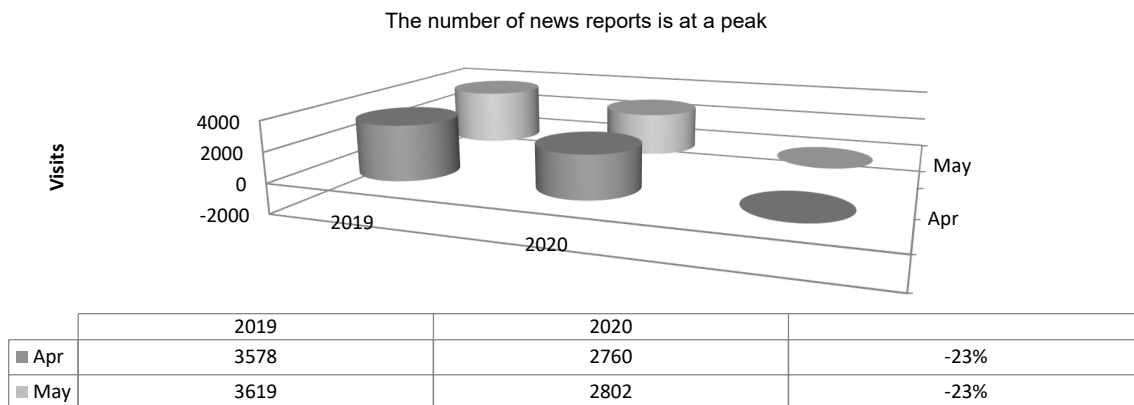
Second, consider changes in the number of relevant news reports and suspected case reports. The volume of news in newspapers during the epidemic reflects the degree of panic that the public may feel. Observe that the number of suspected cases of the novel coronavirus has the same trend as the volume of news reported in Figure 1. The news volume of the new coronavirus showed a similar increase and decrease as the number of cases. A negative correlation was found between the number of suspected cases of the novel coronavirus and the volume of news and the volume of Western medicine outpatient services. The volume of Western medicine outpatient services dropped significantly by 23% when the number of news reports on the novel coronavirus peaked Figure 1 and 2. Therefore, we can preliminarily judge that the people’s perceived risk of seeking medical care affects their medical behavior and indirectly causes the decline in the amount of Western medicine outpatient services.

Figure 1: Trends in COVID-19 News Search Heat in Taiwan



*This figure shows quantity of news stories related to Novel Coronavirus.*

Figure 2: The Number of News Reports Reaches the Peak Outpatient Volume



*This figure shows the relationship between news reports and patient volume.*

Third, consider the impact of individual hospitals on the new coronavirus. Comparing the volume of outpatient medical services of Western medicine in 2019 and 2020, we found the trend in 2020 is lower than in 2019. It may be the result of the unrecovered confidence of people, resulting in individuals fear of seeking medical treatment and delaying a good opportunity for treatment. Panic brought by the new coronavirus epidemic to the public is the main reason for the decline in medical utilization. During the new coronavirus epidemic, large hospitals are the main medical places for diagnosis and treatment of patients. Therefore, the impact of the epidemic on medical utilization may vary.

After comprehensive research data, sorting out the research findings and then further condensing, we find that regional hospitals reacted to the crisis as follows: There is some flexibility in behavior regarding how individual hospitals handled the new type of coronavirus. Negligence is inevitable because of the lack of previous SARS experience in the virus epidemic. The organization can maintain a little flexibility and automatically amend it. It does not stick to the usual rules and regulations to match the current situation and turn things around. For example, the convening of epidemic prevention and control conferences, the formulation of epidemic prevention policies, and the focus on timeliness in the procurement of anti-epidemic materials all show that research hospitals have a certain degree of flexibility and can adjust their response.

Relevant epidemic prevention drills have been conducted many times, and the organization members are skilled in moving lines and processes. Because the hospital is a private hospital, it has a certain degree of crisis sense for infectious diseases, and there may be some shocks at the beginning of the new coronavirus epidemic. Hence, they are constantly practicing and guarding the arrangement of the isolation line in the hospital, the training of the way of wearing the isolation gown, and the simulation of all situations. This is the biggest advantage of the hospital during the epidemic prevention period of the new coronavirus.

Important key persons play a key role, and policy formulation has an expert-oriented style. As far as the leadership is concerned, they have been in the organization for a long time and are familiar with the organization and operation. Major decision-making discussions are conducted in the “sentiment control meeting” during the new coronavirus period. The attendees are all heads of various departments, discussing hospital policies together, which is a “cogovernance” leadership style. In this leadership class, even the deans, directors, etc., can respect the professional opinions of the supervisors of the various departments in the meeting, so that important key people can show their roles in a timely manner. Therefore, in the leadership style, although he is an elite leader, he has an expert-oriented style in policy formulation.

According to interview data, the hospital's antiepidemic supplies are generally sufficient. Although the epidemic is at its peak in February and March 2020, the research hospital was not able to adjust the antiepidemic supplies for a short time. Later, the research hospital material procurement staff had familiar manufacturers, and the Health Bureau had a supply of mask materials. Hence, the epidemic prevention materials were not interrupted, and the staff did not need to worry about material shortage. In addition, the Department of Disease Control of the Ministry of Health and Welfare formulated a "Personal Appropriate Protective Equipment Classification Table" for prevention. Workers on different occasions are assigned different levels of protective equipment for material control.

During the crisis management period, there are many "informal activities." Informal activities mentioned here refer to both communication and emotional support. In task communication, informal communication occupies an important place, which also promotes smoother task execution and improved efficiency. In terms of emotional support, the organization members encourage each other through work friendships and maintain a certain degree of morale at work.

Strict discipline during the epidemic prevention period should be implemented and punished if there is a fault. To improve the vigilance and efficiency of organization members, the reward and punishment system during the epidemic prevention period pays great attention to punishment when there is a fault. The hospital uses various means to exert powerful control: remembering rewards and punishments, forced rollovers, a large number of meetings, ordering publicity, etc. The sole purpose of all actions is to put employees "on the right track." Therefore, "strict discipline and punish once you pass" is a matching method.

The number of personnel in different units of the hospital department will vary. During the epidemic, the distribution and task assignment of frontline personnel will eventually involve a deeper level. When people have doubts about work assignments, the solution may be to have sufficient communication and dialog before assignments, which can also ease emotions and reduce friction.

Daily exercise in the hospital has ordinary effects, and exercises in different units cannot reach the same level of participation and enthusiasm. The attitude of the hospital and unit supervisors affects this behavior. Unit supervisors should force every employee to participate to improve outcomes. Usually focusing on crisis drills can enhance the crisis awareness of organization members.

The use of materials in the hospital during the epidemic prevention period is disturbed, and the unit nursing section chief and frontline nurses were not satisfied with the use of materials. Therefore, the entire hospital should establish a consensus in the use of materials for epidemics: "use when used." The quality of unit supervisors directly affect unit morale. Therefore, unit supervisors must pay attention to their own leadership style and methods, and they must both lead and pay attention when facing subordinates.

Although the hospital management places great importance to the drill process during the epidemic prevention period, some personnel may still neglect or fail to pay attention to the rigor and importance of the operating process. In the face of business, strict implementation of operating procedures can control and prevent many negative outcomes.

## CONCLUDING COMMENTS

This research shows how medical institutions face the global risk of the coronavirus epidemic. Data on the overall medical utilization status of the hospital shows significant change in the medical utilization rate of the hospital, organizational behavior, and the hospital management. The following provides some policy recommendations. First, the organization should try to reduce the burden of unit personnel. Second, hospital leaders should pay attention to the effects of daily exercise. Third, a consensus should be reached



on the use of materials. Forth unit supervisors should lead people to think. Finally operating procedures should be strictly followed.

Owing to the nature of the hospital, the organizational culture tends to be conservative and obedient. Therefore, the mentality of employees is more or less influenced by the hospital and tends to be conservative. Only the unit responsible for the task is actively participating when the hospital is faced with handling risks and changes. When members perform tasks, other units have not actively expressed support and are even in a passive mode. Cultivating a proactive organizational culture of “all as one mind, we can overcome difficulties together.” This mantra can be used in a timely manner when faced with the test of the epidemic (Wenda, 2003). In general, to exert team strength, all members should have the awareness of a community of life to help not only themselves but also others.

This study aims to verify risk management strategies of regional hospitals in the face of epidemic viruses. Due to time and manpower constraints, it is impossible to expand the study to management strategies of other types of hospitals. In addition, the scope of the study is for primary hospitals and does not include higher-level hospitals. Therefore, the conclusion cannot represent the entire medical organization. However, if the research object could be expanded in the future, it will not only target hospitals, but also cover health centers, clinics and outpatient departments. Taking the overall view of medical institutions in the region as the research object, this study verifies the application of risk management strategy and provides policy recommendations on corrective and preventive measures necessary to protect the health sector. It is recommended that future studies use other types of risk quality collection management, data and information sources, internal control, and clinical risks to investigate the hypothetical operation model. It also can be used to confirm the effectiveness of risk management strategies of medical organizations at all levels.

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