The Influence of Organizational Citizenship Behavior and Social Capital on Behavioral Response of Medical Profession under Disaster

於災難侵襲時 組織公民行為 與 社會資本 對醫護人員行為的影響

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ABSTRACT

In this article, we seek to contribute to the body of work by developing the following arguments: (1) the organizational citizenship behavior, which facilitates the creation of social capital, (2) the organization, as an institutional setting by itself, which is conducive to the development of high levels of social capital; and (3) the social capital, which facilitates the creation of organization advantages to overcome the personal anxiety and increase the self confidence among medical and nursing staffs in their work.

A model is presented that incorporates the overall argument in the form of a series of hypothesized relationships between different dimensions of organizational citizenship behavior, social capital, and personal behavioral response. We seek to address this gap and to present a theory of how hospital can cope up during and after SARS outbreak.

There were 211 medical personnel from four medical centers (hospitals) in Taiwan who participated in this study. This study was conducted during and after the SARS outbreak. The participants were given questionnaires for them to fill up and the questions asked are related to organizational citizenship behavior, social capital and behavior response. Factor analysis and regression analysis are employed to investigate their relationship. The results are as follows:

1. **There are 4 dimensions in organization citizenship behavior of medical personnel: loyalty and obedience, supportive and cooperation, functional participation and social participation.**
2. **The dimensions of social capital of medical personnel include structural, relational and cognitive dimensions.**
3. **The behavioral response has two dimensions which include anxiety and confidence.**
4. **The dimension of 'supportive and cooperation' and 'functional participation' have positive influence to the 'structural' and 'relational' dimensions of social capital. The dimensions of 'loyalty and obedience' and social 'participation' shows a positive influence to cognitive social capital.**
5. **During SARS outbreak, the relational social capital may help in reducing the anxiety and thereby enhancing the confidence of medical personnel.**
6. **After SARS outbreak, both the relational and structural social capital can help in reducing the anxiety and enhancing the confidence of medical personnel.**

Key Words: organizational citizenship behavior, social capital, behavioral response

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DECLARATION

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

Chapter 1 Introduction

1.1 Research Motivation and Background

Generally, the primary concern of every competent healthcare personnel deals with rendering an optimal health to the patients. They normally work hard to improve or maintain a patient's well-being. When a victim's life cannot be saved or rescued, it's no big deal even for competent medical personnel because he or she per se is not affected physically, mentally and psychologically. It will only be regarded as one of the failure cases and perhaps one will try hard next time to prevent the occurrence of the said failure case by improving their skill and knowledge. The actual concern of every healthcare personnel is the occurrence of a sudden crisis or disaster that go beyond control where he becomes the afflicted and rescuer as well. There is a tendency that one will suffer not only from psychological torture of being thorned between two roles, that is an afflicted and a rescuer, but also abrading one's self-confidence in caring the victims which thereby affects one's overall performance.

A considerable number of studies (Maes M. et al. 2001; Sijmen A Reijneveld et al, 2003; Katz C.L. et al. 2002; McDermott B.M., Palmcer L.H., 2002; Wang X. et al, 2002) have proven and documented that stress in

general affects the individual well being regardless of age, gender or profession, but seldom has been shown or documented how doctors, nurses and healthcare personnel can cope up when crisis or disaster strikes.

Literature reviews show that Post Traumatic Stress Disorder (PTSD) is an anxiety disorder characterized by symptoms such as persistence and re-experience of the traumatic event, avoidance of stimuli associated with the disaster and hyper-arousal (Maes M. et al., 1994). This is precipitated by extreme traumatic events such as deliberate (e.g. torture) and accidental (e.g. motor vehicle accidents, MVA) man-made traumatic events and natural disasters. There are some reports suggesting that stressful life events preceding and following an event outside the range of usual human experience are useful predictors of the subsequent development of PTSD (Esptein et al., 1998; Tjemsland et al., 1998). A developmental psychopathology approach suggests that stressful events may differentially affect individuals across the life span. This may be due to variations in how a potential victim integrates biological, emotional and behavioral systems and age appropriate differences in individual-context, individual-peer and individual-family interactions (Brett M. et al., 2002).

On 11, September 2001, “Morbidity and Mortality Weekly Report

(MMWR)" stated that Fire Department of New York City (FDNY) rescue workers suffered injuries and illnesses after responding to the World Trade Center (WTC) attacks by terrorists. Medical officers of FDNY Bureau of Health Services (FDNY-BHS) responded to provide emergency medical services. Because of the ongoing fire activity, large numbers of rescue workers and civilians were killed during the attacks, approximately 11,000 FDNY firefighters and many emergency medical service (EMS) personnel incurred substantial exposures to airborne particulate matter.

This report describes morbidity and mortality in FDNY rescue workers during the 11 months period after the attack and documents a substantial increase in respiratory and stress-related illness compared with the time period before the WTC attacks. These injuries and illnesses are reported for the 11 months because onset might be delayed and/or influenced by repeated exposures. Incidence of trauma injuries such as crush injuries, lacerations and fractures markedly increased after the attack but then gradually returned to levels similar to those observed before the attack. Respiratory illnesses such as cough, nasal congestion, chest tightness or chest burning were increased five-fold during the 11 months after the attacks. A Stress-related illnesses show a dramatic increase of 17-fold among the

rescuers during the 11 months after the attacks. Stress-related illnesses include post-traumatic stress disorders, depression, anxiety and bereavement (MMWR, 2002).

Recently, an incident causing a great concern among health care authorities is the recent outbreak of a new viral disease- the so called Severe Acute Respiratory Syndrome (SARS). It is an emerging infectious disease that first manifested and originated from the southern Chinese province of Guangdong in November, 2002. Taiwan, with its close proximity to the epicenters of Severe Acute Respiratory Syndrome (SARS) in Guangdong Province (廣東省), and Hong Kong, with its close business and cultural ties with Mainland China and Taiwan were affected most by SARS epidemic (Shiing-Jer Twu, et al., 2003). In Taiwan, the first case of SARS was reported on 14, March 2003; there were 78 cases by the end of April and 676 cases by the end of May. The first death was reported on April 27, at which time the case-fatality rate (the number of deaths divided by the sum of deaths and recoveries) was only 3.8% (Philip L.H. Yu, 2003). On 21, May 2003, Taiwan reported a cumulative total of 418 probable SARS cases with 52 deaths (Weekly Epidemiological Record, WHO, 2003). Therefore, the case-fatality rate rose markedly to a peak of about 45% and then stabilized at

about 15% in June. It appears to be a major public health threat and a challenge to medical health care providers because it is highly contagious, no specific drug to combat this disease and lack of knowledge regarding this disease. Moreover, if one is exposed to the said disease and is lucky enough to survive, even the closest friend or relative will keep distant from him or her as if he is leprotic.

Doctors, nurses and paramedics are considered as the first line of medical personnel to face and combat the so called life threatening disease-the SARS. Some call them as heroes of the nation because they sacrifice their own personal and family needs in order to attend to the needs of others- like the SARS victims. It is also during this early battle with SARS that cost lives of victims and medical healthcare providers as well. This is attributed mainly due to the lack of adequate knowledge and training to the disease itself not to mention the inadequacy of protective equipments such as isolation gowns, gloves masks, eye protectors etc.

While treating this most dangerous disease, the healthcare providers must also undergo direct contact with the SARS victims by working dayshifts and nightshifts in order to care the victims. They also need to wear uncomfortable isolation gowns and breathing masks to protect themselves

from acquiring the disease. They are not even allowed during work to drink water and to pee for they might acquire and be contaminated by the disease. When they are off duty, they need to be isolated for at least two weeks for physical evaluation to rule out if they are infected or not. Majority of the personnel also revealed that they felt psychologically rejected, discriminated and criticized by family, friends and neighbors because they are in direct contact or exposure with SARS victims as if they have acquired the disease too.

Despite of all these negative drawbacks, the medical personnel are still willing to sacrifice themselves for the betterment of their patients. Are their actions motivated by their professional call of duty or just a mere kindness from the bottom of their heart?

1.2 Research Questions

Doctors, nurses and paramedics in the medical world must not only possess professional knowledge and adequate techniques in order to render medical services to the general population but also must have a good organizational citizenship behavior to further improve their quality of work and job satisfaction (Diane Irvine, 1995; Bolon D. S. 1997 and 1999). The Organizational citizenship behaviors also called as OCBs are important to

build the social capital, which ultimately facilitates organization performance (Nahapiet J. & Ghoshal S. 1998; Bolino, Turnley & Bloodgood, 2002).

Although many researchers (Diane Irvine, 1995; Bolon D. S. 1997; Podsakoff, Ahearne, and MacKenzie, 1997), believed that organizational citizenship behaviors (OCBs) indicates that such a behavior is critical for organizational effectiveness. An empirical basis for making such a claim is lacking because there is very little extant empirical work explaining why OCBs are essential to the effective functioning of organizations, or how OCBs might ultimately relate to hospital performance in critical condition.

This study aims to investigate the relationships of OCBs, social capital and the Behavioral Response to SARS outbreak in the medical profession.

1. What are the dimensions of organization citizenship behaviors in medical personnel?
2. What are the dimensions of social capital in medical personnel?
3. Exploring the influence of organizational citizenship to social capital.
4. Exploring the influence of social capital to behavior response in

critical condition.

Chapter 2 Literature Review

2.1 The theory of organizational citizenship behaviors (OCBs)

The organizational citizenship behaviors are defined as "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization (Organ 1988). They enhance the organizational effectiveness because they "lubricate the social machinery of the organization" (Smith et al., 1983). Based on the review of theoretical and empirical OCBs research, they concluded that organizational citizenship behaviors typically stem from positive job attitudes, task characteristics, and leadership behaviors (Podsakoff, et al., 2000). Thus, prior research indicate that individuals are most likely to go beyond their formal job requirements when they are satisfied with their jobs or committed to their organizations, when they are given intrinsically satisfying tasks to complete, and/or when they have supportive or inspirational leaders (Bolino, et al., 2002).

Graham (1991) suggested that there are three dimensions of organizational citizenship behaviors. **Obedience** describes employees' willingness to accept and abide by the organization's rules, regulations, and procedures. **Loyalty** describes the willingness of employees to subordinate

their personal interests for the benefit of the organization and to promote and defend the organization. Finally, **participation** describes the willingness of employees to be actively involved in all aspects of organization life.

In subsequent empirical work, Van Dyne, Graham, and Dienesch (1994) indicated that participation actually takes three forms. **Social participation** describes employees' active involvement in company affairs (e.g., keeping up with organizational issues or attending non-mandatory meetings), and participation in social activities within the organization. **Advocacy participation** describes the willingness of employees to be controversial in order to improve the organization by making suggestions, innovating, and encouraging other employees to speak up. **Functional participation** describes employee contributions that exceed required work standards. (e.g., volunteering to take on extra assignments, working late to finish important projects, or pursuing additional training and staying abreast of new developments).

2.2 The theory of social capital

The term "social capital" initially appeared in community studies, highlighting the central importance-for the survival and functioning of city neighborhoods-of the networks of strong, crosscutting personal relationships

developed over time that provide the basis for trust, cooperation, and collective action in such communities (Jacobs, 1965). Social capital has also been defined as “the stock of relationship quality that exists among a group of individuals which: motivates their awareness of membership in the group, their interest in acting in the group’s best interest, and facilitates their ability to do so (James N. etc 1999).

Social capital is the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network (Bourdieu, 1986; Burt 1992)

Analysts of social capital are centrally concerned with the significance of relationships as a resource for social action (Jacobs, 1965; Bourdieu, 1986; Loury, 1987; Coleman, 1988 & 1990; Baker, 1990; Burt, 1992).

Consistent with the resource-based view, Nahapiet and Ghoshal (1998) maintain that the development of social capital within an organization is likely to be a source of competitive advantage for a firm. In other words, they assert that networks of strong interpersonal relationships

within an organization ultimately facilitate its success.

Nahapiet and Ghoshal's (1998) framework integrates previous research in the area and offers three specific aspects or dimensions of social capital: a structural dimension, a relational dimension, and a cognitive dimension.

As a set of resources rooted in relationship, social capital has many different attributes, and Putnam (1995) has argued that a high research priority is to clarify the dimensions of social capital. In the context of Nahapiet's (1998) exploration of the role of social capital in the creation of intellectual capital, they suggested that it is usual to consider these facets in terms of three clusters: the **structural**, the **relational**, and the **cognitive** dimensions of social capital.

2.2 .1 Structural Social Capital

It is the overall pattern of connections between actors-that is, who you reach and how your reach them (Burt, 1992). Nahapiet and Ghoshal conceptualize the structural dimension of social capital as encompassing network ties, network configuration, and network appropriability.

Network Ties: They are connections between members of an organization. The fundamental proposition of social capital theory is that

network ties provide access to resources, because social capital constitutes a valuable source of information benefits (i.e., "who you know' affects "what you know") (Nahapiet and Ghoshal, 1998). Previous research using network analysis indicates that these connections can have a significant influence on information transfer (Krackhardt & Hanson, 1993) organizational learning (Fisher & White, 2000), and the execution of organizational activities (Shah, 2000). Burt (1992) suggested that these information benefits occur in three forms: access, timing, and referrals. The term "access" refers to receiving a valuable piece of information and knowing who can use it, and it identifies the role of networks in providing an efficient information-screening and -distribution process for members of those networks. "Timing" of information flows refers to the ability of personal contacts to provide information sooner than it becomes available to people without such contacts. "Referrals" are those processes providing information on available opportunities to people or actors in the network, hence influencing the opportunity to combine and exchange knowledge. Thus, the execution of organizational activities may be more efficient when employees working within a company know one another (Nahapiet and Ghoshal, 1998).

Configuration of Ties: Since "ties" provide the channels for

information transmission. The configuration of the network is an important influence on the accessibility of information resources. While individual connections between organizational members are important, the overall configuration of ties within an organization is important as well. The important factors to consider in understanding a network configuration revolve around such characteristics as structural holes (i.e., the absence of connections between employees), centralization (i.e., the degree to which connections are concentrated among few employees), and density (i.e., the extent to which all employees are interconnected relative to the total number of potential connections among all employees) (Bolino 2002).

Network Appropriability: It can significantly affect the flow of information and assistance within a network (Nahapiet & Ghoshal, 1998). Network appropriability relates to the ease with which different types of relationships can be transferred within a network.

Overall, then, the structural aspect of social capital involves examination of the extent to which individuals in an organization are connected, description of the patterns of connections amount employees, and examination of the usefulness of such connections across contexts (Bolino, etc., 2002).

2.2.2 Relational Social Capital

It describes the kind of personal relationships people have developed with each other through a history of interactions (Granovetter, 1992). This concept focuses on the particular relations people have, such as respect and friendship, that influence their behavior (Nahapiet 1998). According to Nahapiet and Ghoshal (1998), the relational dimension of social capital is characterized by high levels of trust, shared norms and perceived obligations, and a sense of mutual identification. The relational dimension of social capital, thus, concerns affective relationships between employees in which coworker like one another, trust one another, and identify with one another (Bolino, etc., 2002).

Liking: Previous research indicates that interpersonal attraction is often related to aspects of group performance. Krackhardt's (1992) research suggests that individuals in a group are more comfortable with uncertainty and less resistant to change when they like one another. Overall, then workgroups in which members like one another may be more flexible, better able to adapt to a changing environment and higher performing

Trust: Misztal (1966) defines "trust" as the belief that the "results of somebody's intended action will be appropriate from our point of view". The interpersonal trust also arises from a belief in the good intentions,

openness, competence, and reliability of another party (Mishira, 1996). Furthermore, high levels of trust result in a willingness to be vulnerable to the actions of the other party (Mayer, Davis, & Schoorman, 1995). Thus, high levels of trust ultimately may increase innovation, enhance teamwork, and improve organizational functioning (Bouty, 2000; Jones & George, 1998).

Identification: Identification is the process whereby individuals see themselves as one with another person or group of people. The level of group identification is positively associated with communication and cooperation within groups and the extent of concern demonstrated for group activities and outcomes (Campion, Papper, & Medsker, 1996; Kramer, Brewer, & Hanna, 1996; Wit & Wilke, 1992). Thus, identification is likely to contribute to the effective collaboration of employees within organizations as well.

2.2.3 Cognitive Dimension

It refers to those resources providing shared representations, interpretations, and systems of meaning among parties (Cicourel, 1973). This dimension includes shared language and codes (Arrow, 1974; Cicourel, 1973; Monteverde, 1995) and shared narratives (Orr, 1990).

Shared Language: It provides organizational members with the ability to communicate more effectively (Boisot, 1995). Moreover, high levels of cognitive social capital give employees a common perspective that enables them to perceive and interpret events in similar ways (Boland & Tenkasi, 1995; Nohria, 1992).

Shared Narratives: They are the myths, stories, and metaphors that organizational members communicate to one another (Nahapiet & Ghoshal, 1998). These narratives also assist organizational members in interpreting and understanding their experiences in a common way (Morgan, 1986).

Both shared language and shared narratives, therefore, serve to increase the level of understanding among organizational members. These assets also increase the ability of employees to anticipate and predict the actions of other coworkers, thereby facilitating the utilization of various members' inputs, successful coordination of activities, and adaptation to changing conditions (Klimoski &Mohammed, 1994; Krackhardt, 1992)

Although (Nahapiet and Ghoshal, 1998) separated these three dimensions analytically, they recognized that many of the features they described are, in fact, highly interrelated. In sum, the structural dimension has its primary direct impact on the condition of accessibility, and the

cognitive dimension through its influence on accessibility and combination capability, research suggests that the relational dimension of social capital influence three of the conditions for exchange and combination in many ways.

2.3 Behavioral Response of Medical Profession Under Disaster

An article by BRENNAN L., SAGE F. J. and SIMPSON A. (1994) concluded that half of all staff expressed confidence in their personal training in disaster medicine although few had received relevant tuition but had attended an advanced trauma life support (ATLS) provider course. They further concluded that major incident plans are in place and are updated in all the hospitals surveyed.

Another study has shown that such behavioral responses like anxiety and confidence are noted in participants who are exposed to any kind of disaster. A survey was made among healthcare providers in order to measure the knowledge and awareness concerning chemical and biological terrorism (Rose M. A. and Larrimore K. L. 2002). Their findings show that less than 23% of the respondents reported **confidence** to provide healthcare in a terrorism situation and their response indicate a need for healthcare providers in continuing education and staff development to develop,

implement, and evaluate innovative terrorism preparedness programs.

Another article (Wright A. E. and Campos J. A. and Gorder T. 1994) concluded that a training program focusing on in-flight, aircraft-related emergencies can increase the crew's confidence during such situations. Several other benefits occur from the training program.

At the most fundamental level, all human being may respond to their environment and /or event in similar fashion. Disasters are one type of event whereby responses such as **anxiety** are seen as behaviors carry out by man. But such behavior can overcome and gain one's **confidence** by certain measures such as offering programs, aids and support for the betterment of an individual and society as well.

Anxiety is a normal human response to stress. It may be regarded as disorder when it occurs in the absence of and appreciable degree, or kind, of threat or danger. Anxiety disorders are characterized by excessive physiological arousal, cognitive and behavioral disturbance (Keable, 1997).

Confidence means a freedom from doubt in yourself and your abilities. It is also a secret that is confided or entrusted to another. It also referred to a feeling of trust (in someone or something), a trustful relationship or a state

of confident hopefulness that events will be favorable. The confident is not liable to error in judgment or action or having or marked by confidence or assurance.

Chapter 3 Research Design

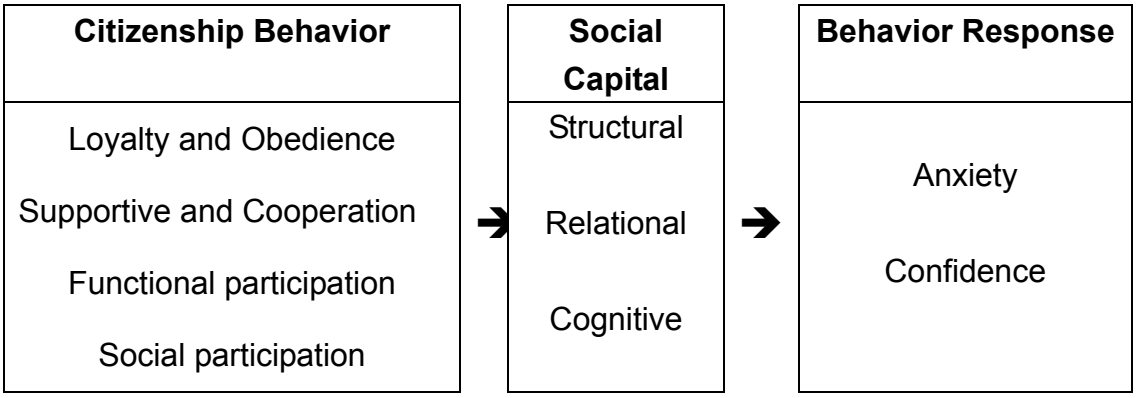
3.1 Framework

The negative consequences of emotional exhaustion for individual employees and their employers were investigated. On the basic of social exchange theory, the authors proposed that emotional exhaustion would predict job performance, two classes of organization citizenship behavior and turnover intentions (Sinta S. Byrne etc, 2003). Tammy D. Allen and Michael C. Rush also studied the process by linking organizational citizenship behavior with performance judgments. Some articles mention and discuss the relationship between social capital, life expectancy and mortality. Since the relationship between organizational citizenship behavior and social capital are well established, the relationship between social capital and some of negative or positive behaviors must also be investigated.

This study formulated a conceptual framework, displayed in Figure 1, through an integration of organizational citizenship behavior, social capital and behavioral response. From the above revealed literatures, the organizational citizenship behavior will influence social capital and then the social capital will influence the behavior response. Thus, different citizenship behavior will create different behavior response. The four

dimensions of citizenship behavior employed in this study are used to examine the effect on the three dimensions of social capital. The three dimensions of social capital are then used to compare the behavior response (anxiety and confidence) during and after severe working stress.

Figure 1 **Conceptual framework** (Nahapiet J. & Ghoshal S. 1998; Cropanzano etc. 2003)



The purpose of this study is to investigate the interaction of each dimension and set the following hypotheses:

3.1.1 The hypothesis of the organizational citizenship behavior and the creation of social capital:

Organizational citizenship behaviors (OCBs) are employee behaviors that go beyond role requirements, that are not directly or explicitly recognized by the formal reward system, and that facilitate organizational functioning (Organ, 1988).

Bolino (2002) argued that OCBs have the capacity to bring people

together in ways that are likely to increase the number of ties among individuals in an organization, to alter the configuration of connection and contacts within an organization in important ways, and to facilitate the development of contacts between individuals in some setting that may ultimately prove useful in other contexts.

Previous research on organizational citizenship behavior and in this pilot study on medical personnel hypothesized that such behavior has significant influence on the social capital. There are four dimensions of citizenship behavior which consist of loyalty and obedience, supportive and cooperation, functional participation, and social participation (Figure 1). There are also three dimensions of social capital which include the structural dimension, relational dimension and cognitive dimension.

Thus, this study has postulated that the four dimensions of OCBs have positive influence on the three dimensions of social capital and are listed as follows:

‘Supportive and cooperation’ and ‘social capital’:

H1a: ‘Supportive and cooperation’ has a positive influence on ‘structural dimension’

H1b: ‘Supportive and cooperation’ has a positive influence on

‘relational dimension’

H1c: ‘Supportive and cooperation’ has a positive influence on ‘cognitive dimension’

‘Loyalty and Obedience’ and ‘social capital’:

H2a: ‘Loyalty and obedience’ has a positive influence on ‘structural dimension’

H2b: ‘Loyalty and obedience’ has a positive influence on ‘relational dimension’

H2c: ‘Loyalty and obedience’ has a positive influence on ‘cognitive dimension’

‘Functional participation’ and ‘social capital’:

H3a: ‘Functional participation’ has a positive influence on ‘structural dimension’

H3b: ‘Functional participation’ has a positive influence on ‘relational dimension’

H3c: ‘Functional participation’ has a positive influence on ‘cognitive dimension’

‘Social participation’ and ‘social capital’:

H4a: ‘Social participation’ has a positive influence on ‘structural dimension’

H4b: ‘Social participation’ has a positive influence on ‘relational dimension’

H4c: ‘Social participation’ has a positive influence on ‘cognitive dimension’

3.1.2 The hypothesis of the social capital and the behavioral response during and after a crisis of danger:

In other work (e.g., Organ, 1988; Podsakoff & MacKenzie, 1997), though, researchers have discussed some more specific ways in which OCBs might positively influence organizational performance: (1) OCBs may enhance coworker or managerial productivity, (2) OCBs may free up resources for more productive purposes, (3) OCBs may reduce the need to devote scarce resources to purely maintenance functions, (4) OCBs may facilitate the coordination of activities between team members and across workgroups, (5) OCBs may enable organizations to attract and retain high-quality employees by making the work environment a more pleasant place to work, (6) OCBs may enhance the stability of organizational

performance by reducing the variability in work unit's performance, and (7) OCBs may enhance an organization's ability to adapt to environment change.

Unfortunately, while the above list does provide a general outline of how OCBs may be related to organizational performance, there is a paucity of empirical research exploring any of these ideas with anxiety and confidence during and after SARS attack.

Some of the previous research described that OCBs enhance organizational effectiveness (Podsakoff etc., 2000). Likewise, social capital is also thought to facilitate the effective functioning of organizations (Adler & Kwon, 2002; Leana & Van Buren, 1999; Nahapiet & Ghoshal, 1998). Furthermore, citizenship behaviors are likely to play an important role in the creation of the structural, relational, and cognitive aspects of social capital. Social capital, in turn, enhances organizational performance. Thus, the relationship between citizenship behavior and firm performance is mediated by social capital (Bolino, Turnley, and Bloodgood, 2002).

Based on the previous articles mentioned above, the social capital may able to tolerate the existence of anxiety and may gain confidence as a result of SARS outbreak. Thus, this study has postulated that the three

dimensions of social capital have positive influence on the two dimensions of behavioral response and are listed as follows:

Structural dimension and behavior responses during SARS outbreak:

H5a: There is a negative relationship between structural dimension and anxiety during SARS outbreak

H5b: There is a positive relationship between structural dimension and confidence during SARS outbreak

Relational dimension and behavior responses during SARS outbreak:

H6a: There is a negative relationship between relational dimension and anxiety during SARS outbreak

H6b: There is a positive relationship between relational dimension and confidence during SARS outbreak

Cognitive dimension and behavior responses during SARS outbreak:

H7a: There is a negative relationship between cognitive dimension and anxiety during SARS outbreak

H7b: There is a positive relationship between cognitive dimension and

confidence during SARS outbreak

Structure dimension and behavior responses after SARS outbreak:

H8a: There is negative relationship between structural dimension and anxiety after SARS outbreak

H8b: There is a positive relationship between structural dimension and confidence after SARS outbreak

Relational dimension and behavior responses after SARS outbreak:

H9a: There is a negative relationship between relational dimension and anxiety after SARS outbreak

H9b: There is a positive relationship between relational dimension and confidence after SARS outbreak

Cognitive dimension and behavior responses after SARS outbreak:

H10a: There is a negative relationship between cognitive dimension and anxiety after SARS outbreak

H10b: There is a positive relationship between cognitive dimension and confidence after SARS outbreak

3.1.3 Summary of each dimension, relationship and hypothesis:

According to the above inferences, all of the directions of hypothesis are collected as follows (Table 1, Table 2 and Table 3).

Table 1: The relationship between citizenship behavior and social capital

The dimensions of citizenship behavior	**The dimension of social capital**		
	Structural	*Relational*	*Cognitive*
Loyalty and Obedience	+ (H1a)	+ (H1b)	+ (H1c)
Supportive and Cooperation	+ (H2a)	+ (H2b)	+ (H2c)
Functional participation	+ (H3a)	+ (H3b)	+ (H3c)
Social participation	+ (H4a)	+ (H4b)	+ (H4c)

'+' positive relationship

'-' negative relationship

Table 2: The relationship between social capital and behavior response during SARS outbreak

Dimension of social capital	**The dimension of behavior response during SARS spreading**	
	Anxiety	*Confidence*
Structural	- (H5a)	+ (H5b)
Relational	- (H6a)	+ (H6b)
Cognitive	- (H7a)	+ (H7b)

'+' positive relationship

'-' negative relationship

Table 3: The social capital and behavioral response after SARS outbreak

Dimension of social capital	The dimension of behavior response after SARS spreading	
	Anxiety	*Confidence*
Structural	- (H8a)	+ (H8b)
Relational	- (H9a)	+ (H9b)
Cognitive	- (H10a)	+ (H10b)

'+' positive relationship

'-' negative relationship

3.2 The Designs of Questionnaires and Pilot Test:

In order to evaluate the relationships among the dimension of organizational citizenship behavior, social capital and behavior response, a set of questionnaires is designed for this study.

3.2.1 Design of the questionnaires:

A 68-item questionnaire in five groups was designed. The first ten questions are related to the basic information of every candidate. Twenty-nine questions will be asked in the part of organizational citizenship behavior and thirteen questions in the part of social capital. In the part of behavior response, a set of nine questions will be asked during and after SARS spreading in order to evaluate the influence of a crisis. The responses are recorded using a 5-point Liker scale where 1 was "Strongly Agree," 3 was "neutral," and 5 was "Strongly Disagree." The subjects are requested to

answer the questions by simply placing a check mark against the answer that applied to their behavior responses.

3.2.1 Pilot test

The questionnaire was pilot tested with 35 staffs in one of the medical centers in Taiwan. Then the questionnaires were collected for revision.

3.2.3 Variables measurement

The series of questions asked are listed below and categorized according to the dimensions of citizenship behavior, dimensions of social capital and behavioral responses.

Table 4: Citizenship behavior

Dimension	Questionnaires and variables	References
Loyalty and obedience	11. My first consideration is the advantage of our hospital. If necessary, I will sacrifice my own personal benefit 12. I am willing to sacrifice and dedicate myself for the sake of our hospital. 13. I am still willing to continue my work even though our hospital is facing enormous trouble. 14. I will recognize, support and protect the aim of our hospital. 15. No matter what rules and regulations our hospital has, I will never complain nor criticize them.	Bolino C. M. et. 2002. Rioux S. M. & Penner L. A. 2002. Coleman V. & Venetta I. & Borman Walter C. 2000.
Supportive and Cooperation	22. I will voluntarily help new colleagues to adapt to their new working environment. 23. I'll be happy to assist my colleagues to help to solve their work difficulty. 24. I'll be happy to cooperate with other department staffs in order to accomplish a mission. 25. I will be happy to help my fellow worker in our hospital. 26. I will strive hard in order to increase the quality of my work.	Podsakoff P. M. et. 2000. Bolon D. S. 1997. Irvine Diane, 1995. Morrison E. W. 1994.
Functional Participation	18. I will provide extra service and assistance to patients. 19. I will put extra effort to help our hospital in overcoming any difficulty. 20. I will spend my extra time for the affair of our hospital. 21. I would work overtime, without pay, to finish my job voluntarily.	Morrison E. W. 1994. Dyne L. V. etc. 1994. Cropanzano etc. 2003
Social Participation	27. I will participate in our hospital's social activities. 28. I will wholeheartedly advocate or actively participate in our hospital's activities in order to improve the relationship with my colleagues. 29. I will participate in our hospital's leisure activities.	

Table 5: Social capital

Dimension	Questionnaires and variables	References
Structural	30. I always participate in our department's social activities. 31. I know my colleague's family members. 32. I know my colleague's close friends. 42. I always talk about the recent social affair, popular life trend or financial and economic news. 41. I always talk about medical knowledge (or professional business) with our colleagues.	Bolino C. M. et. 2002. Nahapiet J. & Ghoshal, 1998.
Relational	33. My colleague is willing to lend a hand when I need help. 34. I don't have any harmful intention with my colleague for my own personal advantage and vise versa. 35. Between me and my colleague, I am not worried that I am being used for his own personal advantage and vise versa. 36. My colleagues and I rely on each other. 37. We are not jealous of each other.	Coleman J. S. 1988.
Cognitive	38. Majority of our colleagues are schoolmates. 39. We will share our vision and ambition. 40. We work hard for our ideal.	

Table 6: Behavior response

Dimension	Questionnaires and variables	References
Anxiety	51. I feel physically exhausted. 52. I feel psychologically exhausted. 53. I am thinking of trying to get away from my work. 54. I am worried of being infected by SARS. 55. I am much tensed when I am on duty. 56. I am afraid for no reason.	McDermott B. M. & Palmer L. J. 2002. Reijneveld S. A., Crone M. R., Verhulst F. C., & Verloove-Vanhorick S. P. 2003 Rose M. A. & Larrimore K. L. 2002
Confidence	57. I am confident enough to handle SARS patients. 58. I believe that my colleagues will cooperate in combating against SARS. 59. I think SARS is not that fearful.	Wright A. E. , Campos J. A., & Gorder T. 1994

3.3 Questionnaires collection and sample structure:

3.3.1 Sample structures and collection of questionnaires:

The research was conducted in four medical centers. They covered island wide of Taiwan. Two medical centers located in north of Taiwan. One located in central of Taiwan. The fourth located in south of Taiwan. The said medical centers have complete facilities, such as negative air pressure isolated wards, and special trained staffs exclusively in caring the SARS patient. All of the respondents belong to the every department of the hospital which has direct contact with the SARS patient.

Out of 244 copies of questionnaires sent to the 'Department of job performance or research and education' from each medical hospital, 211 questionnaires are returned. The percentage of questionnaires' return rate is 86.5% (Table 7).

Table 7: Percentage of questionnaires returned by region

	Delivered	Returned
Taipei 1	60	40 (66.7%)
Taipei 2	60	58 (96.7%)
Taichung	64	64 (100%)
Kaohsiung	60	49(81.7%)
Total	244	211(86.5%)

The profiles of all respondents are illustrated in Figure 2 to Figure 7 below. In figure 2, 79 (37.5%) of the personnel are between 31-35 years of age while 52 (24.6%) of the personnel are between 26-30 years of age. Among which 51 (24.2%) were male and 159 (74.5%) were female (Figure 3). There are 120 (56.5%) personnel already married while 91 (43.5%) are still single. An estimated of 119 (54.3%) had an educational attainment of bachelors while 92 (38.2%) are college graduates. Figure 4 is the distribution of the respondents from the four hospitals. They have similar percentage of respondents. Figure 5 is the distribution of respondents on each hospital department. Most of the respondents belong to the anesthesia department (26.5%), emergency department (23.2%), chest medicine or respiratory therapy department (20.9%) and intensive care unit department (17.1%). Figure 6 shows most of the respondents are registered nurses (60.3%) and resident doctors (12.8%). They are at the lower to middle ranks of medical profession. 102 (50.7%) personnel had a temporary contact with SARS patients while 34 (16.1%) personnel had taken cared the SARS patients, the remaining 69 (32.7%) had no contact with SARS patients (Figure 7). Due to direct contact with SARS victims, 15 (8.1%) staffs are isolated while 167 (89.8%) are not isolated.

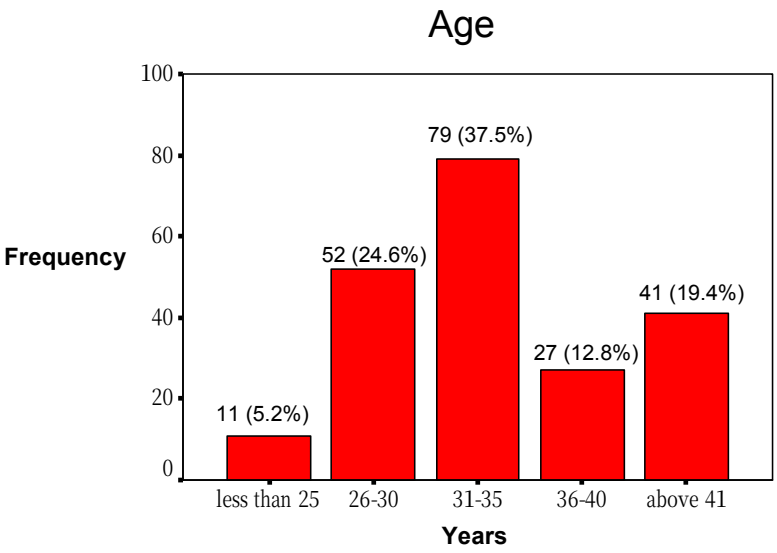


Figure 2 **Distribution of medical personnel by age**

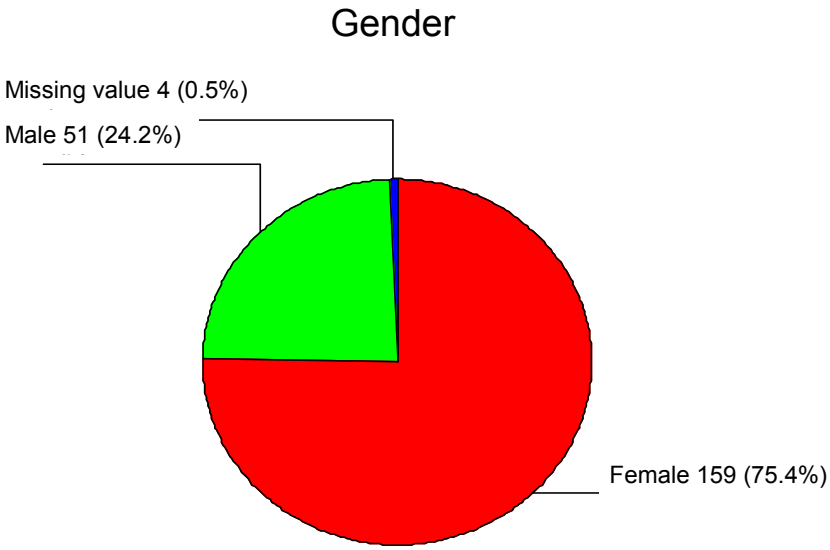


Figure 3 **Distribution of medical personnel by gender**

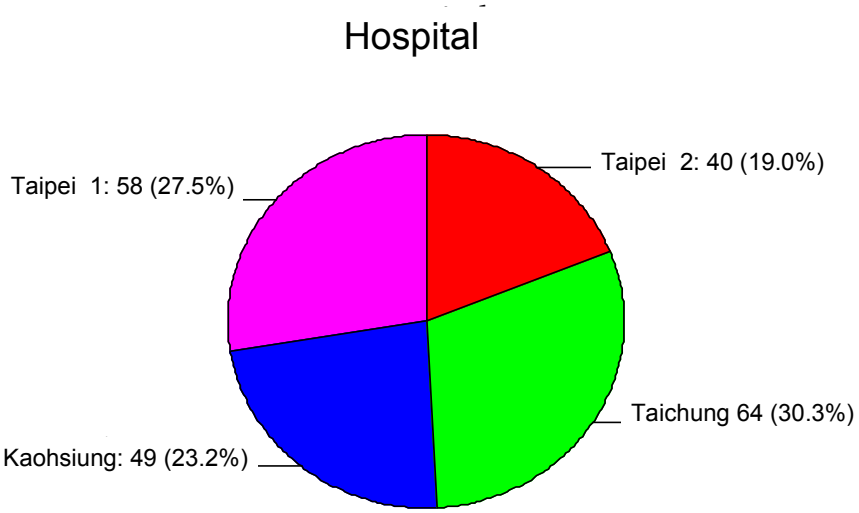


Figure 4 **Distribution of medical personnel by hospitals**

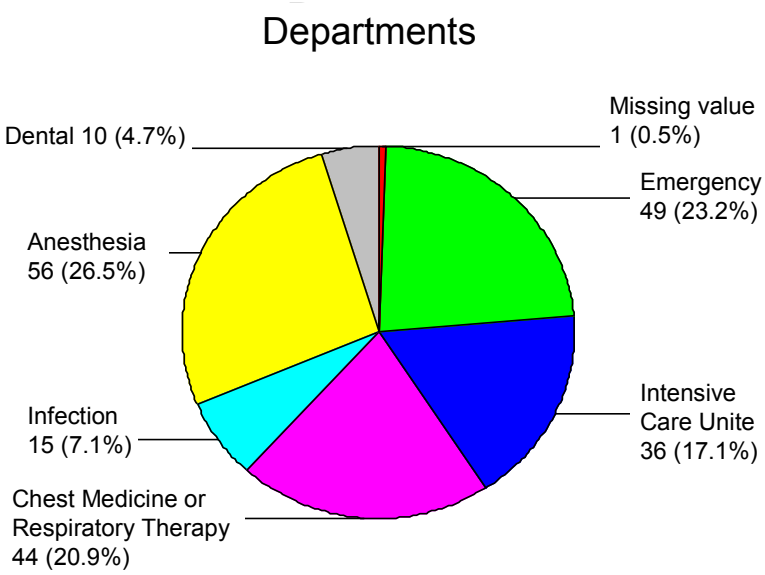


Figure 5 **Distribution of medical personnel by departments**

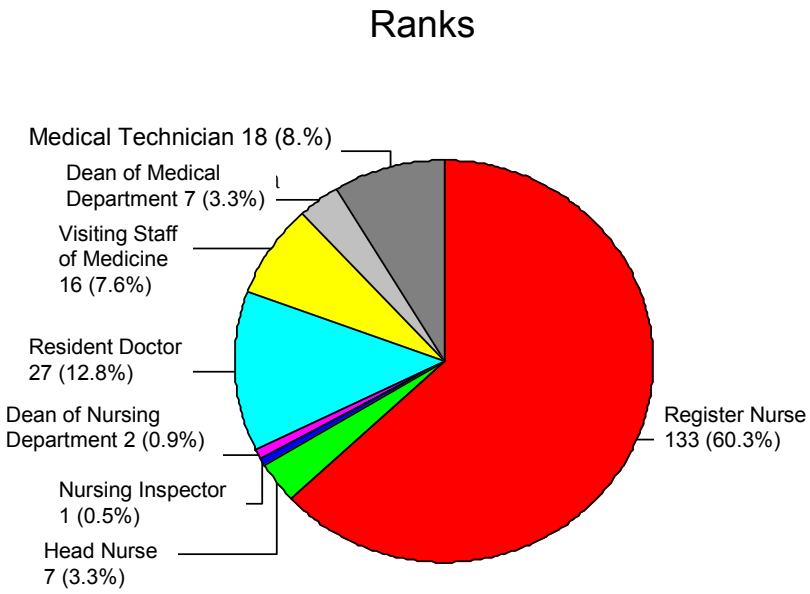


Figure 6 **Hospital ranks of staffs**

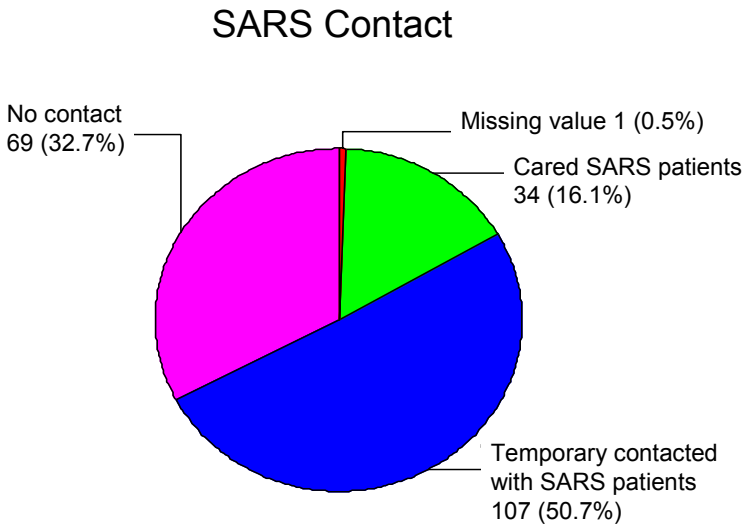


Figure 7 **Distribution of medical personnel exposed to SARS**

3.3.2 Statistic method:

3.3.2.1 Exploratory factor analysis:

In this study, organization citizenship behavior (supportive and cooperation, loyalty and obedience, functional participation, and social participation), social capital (structural dimension, relational dimension, and cognitive dimension), behavioral response (anxiety and confidence) are employed to analyze each dimension. Factor Analysis is used to extract the main factor. Principle Component Analysis is used to extract the factors where Eigenvalue is greater than 1. The standard of each factor is accepted by Varimax analysis if the absolute value of factor loading greater than 0.6. Then the name of each factor will be nominated by their nature of its questionnaires.

3.3.2.2 Reliability analysis:

Cronbach's Coefficient Alpha is used to evaluate the internal consistency of every dimension. The greater Cronbach's Coefficient Alpha value is got, the higher internal consistency and reliability is confirmed. The standard of factor which will be accepted in this study is at least higher than 0.6 of Cronbach's Alpha value.

3.3.2.3 Regression analysis:

Linear regression is used to predict the dependent variables by independent variables.

3.3.2.4 Difference analysis

The age range is divided into: below twenty-five, twenty-six to thirty, thirty-one to thirty-five, thirty-six to forty, and above forty-one years old. The educational attainment level is divided into: high school, college, bachelor, master and PhD. The departments where they are servicing include: emergency room, intensive care unit, respiratory therapy, chest medicine, infection, and anesthesia. The job status of the respondents is nursing staffs and medical doctors. The nursing staffs include the registered nurses, head nurses, nursing inspectors, associate Dean of nursing and Dean of nursing. The medical doctors include the residents, visiting staffs, and section chiefs. The civil status of respondent are classified as single, married, divorcee, separated, and widow. The nature of contact with SARS patients are classified according to: total care and exposure with SARS patients, temporary contact with SARS or suspected SARS patients and no contact with any SARS patients. The respondents are also asked for signs and symptoms of SARS and if they have been isolated or not.

Chapter 4 Result

4.1 Descriptive statistic of every dimension

4.1.1 Citizenship behavior

The standard deviation of each item on the OCB scale is presented in Table 8. The scores and the standard deviation represent respondent's rating of the frequency with which they engaged in each of the behaviors identified on the OCB instrument. The scores will range from 1 to 5. The item with the smallest standard deviation (0.600) was 'I will be happy to help my fellow worker in our hospital'. The item with the largest standard deviation (0.904) was 'I am willing to sacrifice and dedicate myself for the sake of our hospital'.

The mean level of factor 1 'Loyalty and obedience' is between 2.87 to 3.85. It implies that the personnel have fair to moderate level of loyalty and obedience to their hospital. The mean level of factor 2 'supportive and cooperation', is between 4.06 and 4.20. It implies that respondents are supportive and cooperative with their colleagues. This factor also shows the highest mean level among the four factors of organizational citizenship behavior. The mean level of factor 3 (functional participation) is within 3.16 to 4.16. It implies that the personnel have moderate to high level of

functional participation. The mean level of factor 4 (social participation') is within 3.39 to 3.56. It implies that the personnel have moderate level of social participation.

4.1.2 Social capital

The standard deviation of each item on the instrument scale measuring the social capital is presented in Table 9. The scores may range from 1 to5. The item with the lowest standard deviation (0.611) is 'I don't have any harmful intention with my colleague for my own personal advantage and vise versa'. The item with the highest standard deviation (1.012) is 'Majority of our colleagues are schoolmates'. The mean level of factor 1 'structure dimension' is between 3.45 and 3.87. It implies that the personnel have moderate levels of interaction among colleagues. The mean level of factor 2 (relational dimension) is between 3.77 and 4.00. It implies that they have middle to high level of relationship. The mean level of factor 3 (cognition) is between 2.84 to 3.7 and implies that respondents have lower to middle level of cognition among of them.

Table 8 Descriptive statistics of Citizenship Behavior

	Mean	Std. Deviation
Factor 1: Loyalty and Obedience		
11. My first consideration is the advantage of our hospital. If necessary, I will sacrifice my own personal benefit.	**3.53**	**0.852**
12. I am willing to sacrifice and dedicate myself for the sake of our hospital.	**3.40**	**0.904**
13. I am still willing to continue my work even though our hospital is facing enormous trouble.	**3.74**	**0.799**
14. I will recognize, support and protect the aim of our hospital.	**3.85**	**0.764**
15. No matter what rules and regulations our hospital has, I will never complain nor criticize them.	**2.87**	**0.987**
Factor 2: Supportive and Cooperation		
22. I will voluntarily help new colleagues to adapt to their new working environment.	**4.16**	**0.636**
23. I'll be happy to assist my colleagues to help to solve their work difficulty.	**4.20**	**0.625**
24. I'll be happy to cooperate with other department staffs in order to accomplish a mission.	**4.10**	**0.624**
25. I will be happy to help my fellow worker in our hospital.	**4.06**	**0.600**
26. I will strive hard in order to increase the quality of my work.	**4.13**	**0.635**
Factor 3: Functional Participation		
18. I will provide extra service and assistance to patients.	**3.84**	**0.697**
19. I will put extra effort to help our hospital in overcoming any difficulty.	**3.73**	**0.794**
	3.16	**0.827**
20. I will spend my extra time for the affair of our hospital.	**3.70**	**0.864**
21. I would work overtime, without pay, to finish my job voluntarily.	**4.16**	**0.636**
Factor 4: Social Participation		
27. I will participate in our hospital's social activities.	**3.45**	**0.880**
28. I will wholeheartedly advocate or actively participate in our hospital's activities in order to improve the relationship with my colleagues.	**3.56**	**0.807**
29. I will participate in our hospital's leisure activities.	**3.39**	**0.856**

Table 9 Descriptive statistics of Social Capital

	Mean	Std. Deviation
Factor 1: Structural Dimension		
30. I always participate in our department's social activities.	**3.63**	**0.836**
31. I know my colleague's family members.	**3.59**	**0.810**
32. I know my colleague's close friends.	**3.45**	**0.776**
41. I always talk about medical knowledge (or professional business) with our colleagues.	**3.87**	**0.720**
42. I always talk about the recent social affair, popular life trend or financial and economic news.	**3.77**	**0.687**
Factor 2: Relational Dimension		
33. My colleague is willing to lend a hand when I need help.	**3.96**	**0.614**
34. I don't have any harmful intention with my colleague for my own personal advantage and vise versa.	**4.00**	**0.611**
35. Between me and my colleague, I am not worried that I am being used for his own personal advantage and vise versa.	**3.77**	**0.708**
36. My colleagues and I rely on each other.	**3.83**	**0.695**
37. We are not jealous of each other.	**3.78**	**0.758**
Factor 3: Cognitive Dimension		
38. Majority of our colleagues are schoolmates.	**2.84**	**1.012**
39. We will share our vision and ambition.	**3.64**	**0.659**
40. We work hard for our ideal.	**3.70**	**0.716**

4.1.2 Behavior response during and after SARS spreading

The standard deviation of each item on the instrument scale measuring behavior response is presented in Table 10. The scores may range from 1 to5. During the period of SARS outbreak, the item with the lowest standard deviation (0.868) is ‘I believe that my colleagues will cooperate in combating against SARS’. The item with the highest standard deviation (1.116) is ‘I am much tensed when I am on duty’. Whereas, the item with the lowest standard deviation (0.830) is ‘I am confident enough to handle SARS patients’. The item with the highest standard deviation (0.915) is ‘I am worried of being infected by SARS’. After SARS outbreak, the range of mean level in factor 1 (anxiety) is 2.28-2.95. It implies that respondents have moderate level of anxiety. However, the anxiety has decreased mildly (2.95-2.28) after the SARS attack. The mean level of factor 2 (confidence) does not change during and after the SARS outbreak. The mean level during and after SARS outbreak is 2.28-2.95 and 3.49-3.82 respectively. It implies that the respondent’s confidence did not change much during and after the SARS attack.

Table 10 **Descriptive statistics of Behavior Response during and after SARS Spreading**

	During SARS		After SARS	
	Mean	Std. Deviation	Mean	Std. Deviation
Factor 1: Anxiety				
51. I feel physically exhausted.	**3.42**	**0.994**	**2.83**	**0.894**
52. I feel psychologically exhausted.	**3.33**	**1.035**	**2.78**	**0.934**
53. I am thinking of trying to get away from my work.	**2.74**	**1.064**	**2.41**	**0.898**
54. I am worried of being infected by SARS.	**3.52**	**1.012**	**2.95**	**0.951**
55. I am much tensed when I am on duty.	**3.05**	**1.116**	**2.57**	**0.933**
56. I am afraid for no reason.	**2.57**	**1.107**	**2.28**	**0.863**
Factor 2: Confidence				
57. I am confident enough to handle SARS patients.	**3.40**	**0.892**	**3.49**	**0.830**
58. I believe that my colleagues will cooperate in combating against SARS.	**3.80**	**0.868**	**3.82**	**0.868**
59. I think SARS is not that fearful.	**3.60**	**0.972**	**3.69**	**0.905**

4.2 Factor analysis

4.2.1 Dimension of Organizational citizenship behavior

The results of Factor analysis of the four factors of organizational citizenship behavior are presented in Table 11. Seventeen of nineteen OCBs are loaded significantly on the four factors: four OCBs are loaded on the first factor, five OCBs are loaded on the second factor, four OCBs are loaded on

the third factor, and three OCBs are loaded on the fourth factor. The item 16 and 17 did not load significantly on any of the four factors.

It was found out that all of the four factors shown as having an eigenvalue of greater than one while the “cumulative variance explained” is about 74.041%. The Cronbach’s α value of every factor (0.9114, 0.8835, 0.8441, and 0.877) is much higher than 0.6. This implies that there is a very high internal unity among the staffs.

Based on the type and characteristics of every question asked in each factor, it is then nominated and agreed that factor 1 which measures the ability of colleagues to help each other, is labeled as “**supportive and cooperation**” , factor 2 which defines one’s dedication towards work, is named as “ **loyalty and obedience**” , factor 3 which measures the ability to provide extra service, is termed as “**functional participation**” and factor 4 consists of measuring one’s participation in social activities is coined as “ **social participation**”.

Table 11 **Result of Factor Analysis of Citizenship Behavior**

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1: Supportive and Cooperation				
23. I'll be happy to assist my colleagues to help to solve their work difficulty.	**0.867**	0.156	0.183	0.100
22. I will voluntarily help new colleagues to adapt to their new working environment.	**0.850**	0.123	0.316	0.83
25. I will be happy to help my fellow worker in our hospital.	**0.824**	0.132	0.222	0.278
24. I'll be happy to cooperate with other department staffs in order to accomplish a mission.	**0.737**	0.111	0.241	0.211
26. I will strive hard in order to increase the quality of my work.	**0.715**	0.34	0.231	0.300
Factor 2: Loyalty and obedience				
11. My first consideration is the advantage of our hospital. If necessary, I will sacrifice my own personal benefit	0.083	**0.838**	0.234	0.139
12. I am willing to sacrifice and dedicate myself for the sake of our hospital.	0.038	**0.838**	0.232	0.161
13. I am still willing to continue my work even though our hospital is facing enormous trouble.	0.340	**0.747**	0.197	0.195
14. I will recognize, support and protect the aim of our hospital.	0.293	**0.738**	0.234	0.060
15. No matter what rules and regulations our hospital has, I will never complain nor criticize them.	-0.54	**0.726**	-0.013	0.246

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Factor 3: Advocacy Participation				
18. I will provide extra service and assistance to patients.	0.266	0.073	**0.772**	0.099
19. I will put extra effort to help our hospital in overcoming any difficulty.	0.350	0.208	**0.768**	0.232
20. I will spend my extra time for the affair of our hospital.	0.206	0.266	**0.758**	0.254
21. I would work overtime, without pay, to finish my job voluntarily.	0.248	0.216	**0.640**	0.141
Factor 4: Social Participation				
29. I will participate in our hospital's leisure activities.	0.176	0.207	0.137	**0.855**
28. I will wholeheartedly advocate or actively participate in our hospital's activities in order to improve the relationship with my colleagues.	0.302	0.203	0.104	**0.823**
27. I will participate in our hospital's social activities.	0.147	0.213	0.211	**0.821**
Eigenvalue	**7.665**	**2.273**	**1.575**	**1.075**
Percentage of Variance Explained %	**45.086**	**13.370**	**9.263**	**6.322**
Cumulative Variance Explained %	**45.086**	**58.456**	**67.719**	**74.041**
Cronbach's α	**0.9114**	**0.8835**	**0.8441**	**0.8777**

4.2.2 Dimension of social capital

In this study, the personnel from the four hospitals were asked thirteen questions in order to determine their responses regarding the social capital. These questions were grouped into three factors. Every factor represents a type of capital.

Factor loadings for the three factors of social capital are presented in Table 12. All of the 13 items loaded significantly on the three factors: five

items loaded on the first factor, five items loaded on the second factor, and three items loaded on the third factor. The factor loadings of the five items of 'relational dimension' are 0.813, 0.810, 0.803, 0.789, and 0.594 respectively. The factor loading of the five items of 'structural dimension' are 0.852, 0.841, 0.633, 0.617, and 0.589, respectively. The factor loadings of the three items of 'cognitive dimension' are 0813, 0.564, and 0.563, respectively. It was found out that all of the three factors shown as having an eigenvalue of greater than one while the "cumulative variance explained" is about 64.575%.

The high reliability (Cronbach's α) of the three factors of social capital are 0.8164, 0.8620 and 0.6775, respectively and higher than 0.6. They suggested that these items are measuring a specific construct and thus regarded as having a high internal unity among the staffs.

Based on the type and characteristics of every question asked in each factor, it is then nominated and agreed that factor 1 which measures the interrelationship of colleagues, is labeled as "**Relational dimension**", factor 2 which defines structure of relationship, is named as "**Structural dimension**" , factor 3 which measures the quality of relationship, is termed as "**Cognitive dimension**".

Table 12 **Result of Factor Analysis of Social Capital**

	Factor 1	Factor 2	Factor 3
Factor 1: Relational Dimension			
35. Between me and my colleague, I am not worried that I am being used for his own personal advantage and vise versa.	**0.813**	0.142	0.218
36. My colleagues and I rely on each other.	**0.810**	0.215	0.86
37. We are not jealous of each other.	**0.803**	0.007	0.113
34. I don't have any harmful intention with my colleague for my own personal advantage and vise versa.	**0.789**	0.202	0.41
33. My colleague is willing to lend a hand when I need help.	**0.598**	0.503	-0.178
Factor 1: Structural Dimension			
31. I know my colleague's family members.	0.107	**0.852**	0.088
32. I know my colleague's close friends.		**0.841**	
41. I always talk about medical knowledge (or professional business) with our colleagues.	0.408	**0.633**	0.217
42. I always talk about the recent social affair, popular life trend or financial and economic news.	0.202	**0.617**	0.264
30. I always participate in our department's social activities.	0.236	**0.589**	0.172
Factor 3: Cognitive Dimension			
38. Majority of our colleagues are schoolmates.	-0.44	0.112	**0.813**
40. We work hard for our ideal.	0.467	0.367	**0.564**
39. We will share our vision and ambition.	0.424	0.385	**0.563**
Eigenvalue	**5.582**	**1.764**	**1.050**
Percentage of Variance Explained	**42.935**	**13.567**	**8.074**
Cumulative Variance Explained	**42.935**	**56.502**	**64.575**
Cronbach's α	**0.8164**	**0.8620**	**0.6775**

4.2.3 Dimension of behavior response during and after SARS

In this study, the personnel from different hospitals were asked nine questions in order to determine their responses regarding the behavior response. These questions were grouped into two factors. Every factor represents a type of behavior response. Based on the type and characteristics of every question asked in each factor, it is then nominated and agreed that factor 1 which measures their tension, is labeled as "**Anxiety**" type, factor 2 which defines the assurance of colleagues to each other, is labeled as "**Confidence**".

Factor loadings on the two factors of Behavior Response **during** SARS outbreak are presented in Table 13. All of the items are loaded significantly on the two factors: six items loaded on the first factor, **Anxiety** and three items loaded on the second factor, **Confidence**. The factor loadings of the six items of **Anxiety** are 0.882, 0.877, 0.841, 0.811, 0.766, and 0.749 respectively. The factor loadings of the three items of **Confidence** are 0.840, 0.804, and 0.738 respectively. The total of the two factors explained 67.673% of the variance. The high reliability (Cronbach's α) of the first factor is 0.9037 while the second factor has 0.7226. They suggested that these two items were measuring a specific construct and have very high

internal unity among the personnel.

Factor loadings on the two factors of Behavioral Response **after** SARS outbreak are also presented in Table 14. The factor loadings of the six items of **Anxiety** are 0.860, 0.823, 0.808, 0.812, 0.592, and 0.777 respectively. The factor loadings of the three items of **Confidence** are 0.813, 0.848, and 0.742 respectively. The total of the two factors explained 63.339% of the variance. The high reliability (Cronbach's α) of the first factor is 0.8782 and the second factor has 0.7337. They suggested that these two items were measuring a specific construct and have very high internal unity among the staffs.

It was found out that all the two factors shown as having an eigenvalue of greater than one while the "cumulative variance explained" is about 68.577%. The Cronbach's value in every factor is higher than 0.6. This implies that there is a very high internal unity among the staffs.

Table 13 **Results of Factor Analysis on Behavior Response during and after SARS outbreak**

	During SARS		After SARS	
	Factor 1	Factor 2	Factor 1	Factor 2
Factor 1: Anxiety				
55. I am much tensed when I am on duty.	**0.882**	-0.116	**0.860**	-0.103
52. I feel psychologically exhausted.	**0.877**	0.149	**0.823**	-0.076
51. I feel physically exhausted.	**0.841**	0.158	**0.808**	-0.145
56. I am afraid for no reason.	**0.811**	-0.132	**0.812**	-0.075
54. I am worried of being infected by SARS.	**0.766**	-0.095	**0.592**	-0.126
53. I am thinking of trying to get away from my work.	**0.749**	-0.142	**0.777**	-0.010
Factor 2: Confidence				
59. I think SARS is not that fearful.	-0.159	**0.840**	**-0.086**	**0.813**
58. I believe that my colleagues will cooperate in combating against SARS.	**0.050**	**0.804**	-0.135	**0.848**
57. I am confident enough to handle SARS patients.	**0.738**	**0.738**	-0.047	**0.742**
Eigenvalue	**4.110**	**1.980**	**3.930**	**1.770**
Percentage of Variance Explained	**45.669**	**22.004**	**43.671**	**19.671**
Culminated Variance Explained	**45.669**	**67.673**	**43.671**	**63.339**
Cronbach's α	**0.9037**	**0.7226**	**0.8782**	**0.7337**

4.3 Regression analysis

4.3.1 The relationship between OCBs and social capital

The independent variables of OCBs consisted of supportive and cooperation, loyalty and obedience, functional participation and social Participation. The dependent variable includes the relational, structural and cognitive dimensions. The result of the regression analysis is seen in Table 14.

Table 14 **Results of Regression Analysis between OCBs and Social Capital**

	Structural			Relational			Cognitive		
	Beta	*t*	P	Beta	*t*	P	Beta	*t*	P
Loyalty and Obedience	0.109	1.708	0.089	0.106	1.687	0.093	0.224	3.244	0.001
Supportive and Cooperation	0.295	4.635	0.000*	0.474	7.547	0.000*	-0.50	-0.724	0.470
Functional Participation	0.286	4.503	0.000*	0.202	3.299	0.001*	0.013	0.191	0.849
Social participation	0.281	4.418	0.000*	0.069	1.095	0.275	0.269	3.890	0.000*
R		0.507			0.530			0.351	
R^2		0.257			0.281			0.123	
Adjusted R^2		0.241			0.265			0.104	
F		15.925			17.960			6.451	
Significance F		0.000*			0.000**			0.000*	
Durbin-Watson		1.920			1.712			1.653	

# P<0.1; ‡ P<0.05; * P<0.01

In the regression model, variation in OCBs explained 24.1%, 26.5%, and 35.1% of the variance in the dimensions of structural, relational, and cognitive of social capital respectively. Their F values are 15.925, 17.960, and 6.451 respectively and all of them shows statistic significance (P<0.01) and have linear relationship between OCBs and social capital. The values of Durbin-Watson Statistic are 1.920, 1.712 and 1.653 respectively. The three dimensions are not self-correlated because the three DW values are larger than 1.5. Therefore, OCBs proved to be a solid predictor of social capital**.**

The results of comparison of the hypotheses and empirical study of the relationship between OCBs and social capital are seen in figure 16 and

the descriptions are as follows:

4.3.1.1 “Loyalty and Obedience” and Social Capital

The ‘structural’ and ‘relational’ dimensions have no relationship ($p>0.05$) with ‘loyalty and obedience’. The cognitive dimension has positive relationship with ‘loyalty and obedience’.

4.3.1.2 “Supportive and Cooperation” and social capital

The ‘structural and Relational dimensions’ have positive relationship with ‘supportive and cooperation dimension’, but there is no relationship between ‘cognitive’ and ‘supportive and cooperation’.

4.3.1.3 Functional Participation and social capital

The ‘structural and relational dimensions’ have positive relationship with ‘functional participation’, but there is no relationship between ‘cognitive’ and ‘functional participation’.

4.3.1.4 Social participation and social capital

The ‘social participation’ and ‘relational’ do not correlate with each other. The ‘structural and relational dimension’ has positive relationship with social participation.

Table 15 **Comparison of the hypothesis and empirical study results of the relationship between OCBs and social capital**

Dimensions of OCBs	Structural		Relational		Cognitive	
	Hypothesis	*Result*	*Hypothesis*	*Result*	*Hypothesis*	*Result*
Loyalty and Obedience	+ (H1a)	+	+ (H1b)	+	+ (H1c)	+
Support and cooperation	+ (H2a)	+	+ (H2b)	+	+ (H2c)	+
Social participation	+ (H3a)	+	+ (H3b)	+	+ (H3c)	+
Advocacy participation	+ (H4a)	+	+ (H4b)	+	+ (H4c)	+

'+' positive relationship

'-' negative relationship

4.3.2 The relationship between social capital and behavior response

Three dimensions of social capital are used as independent variable. The dependent variables of behavior response include anxiety and confidence. Table 16 is the regression model during SARS outbreak, variation in **social capital** explained only 1.8% and 7% of the variance in the dimensions of **anxiety**, and **confidence** of **behavioral response** respectively. Therefore social capital and behavioral response have low linear relationship. The F value of anxiety is 2.188 and shows statistic significance ($P<0.05$) whereas the F value of **confidence** is 5.818 and shows statistic significance ($P<0.01$). However, the values of Durbin-Watson Statistic are 1.681 and 1.672 respectively. These two dimensions are not self-correlated because the three DW values are larger than 1.5. Therefore, social capital may not be a good predictor of behavioral response**.**

Table 16 **Results of Regression Analysis between Social Capital and Behavior Response during SARS outbreak**

	Anxiety			Confidence		
	Beta	*t*	P	Beta	*t*	P
Relational	-0.157	-0.144	0.029*	0.258	3.701	0.000*
Structural	-0.020	-2.195	0.785	0.129	1.835	0.065#
Cognitive	-0.085	-1.186	0.237	0.038	0.541	0.589
R		0.183			0.291	
R^2		0.034			0.085	
Adjusted R^2		0.018			0.070	
F		2.188			5.818	
Significance F		0.091			0.001	
Durbin-Watson		1.681			1.672	

# P<0.1; ‡ P<0.05; * P<0.01

The results of the comparison of hypotheses and empirical study relationship between social capital and behavioral response are seen in Figures 17 and the descriptions are as follows:

5.3.2.1 Relational dimension and behavior response during SARS outbreak

The ‘relational’ and ‘anxiety’ dimensions have positive relationship. Therefore it matched to the hypothesis of this study and H6a is established. The dimensions of ‘relational’ and ‘confidence’ have positive relationship. Therefore it matched to the hypothesis of this study and H6b is established.

5.3.2.2 Structural dimension and behavior response during SARS outbreak

The dimensions of 'structural' and 'anxiety' have negative relationship. Therefore it did not match to the hypothesis of this study and H7a is not established. The dimensions of 'structural' and 'belief' have negative relationship. Therefore it did not match to the hypothesis of this study and H7a is not established.

5.3.2.3 Cognitive dimension and behavior response during SARS outbreak

The dimensions of 'cognitive' and 'anxiety' have negative relationship. Therefore it did not matched to the hypothesis of this study and H8a was not established. The dimensions of 'cognitive' and 'confidence' have no relationship. Therefore it did not matched to the hypothesis of this study and H7b was not established.

Table 17 **Comparison of the hypothesis and empirical study results of social capital and behavior response during SARS outbreak**

Dimension of social capital	**Anxiety**		**Confidence**	
	Hypothesis	*Result*	*Hypothesis*	*Result*
Structural	- (H5a)	-	+(H5b)	+
Relational	- (H6a)	-	+(H6b)	+
Cognitive	- (H7a)	-	+(H7b)	+

'+' positive relationship

'-' negative relationship

Table 18 is the regression model after SARS outbreak, variation in **social capital** explained only 11.0% and 12.3% of the variance in the dimensions of **anxiety**, and **confidence** of **behavioral response** respectively. Their F values are 8.468 and 9.537 respectively and all of them show statistical significance (P<0.01) and have linear relationship between OCBs and social capital. The values of Durbin-Watson Statistic are 1.678 and 1.809 respectively. They are not self-correlated because the two DW values are larger than 1.5. Therefore, OCBs proved to be a predictor of behavioral response**.**

Table 18 **Results of Regression Analysis between Behavior Response and Social Capital after SARS outbreak**

	Anxiety			Confidence		
	Beta	*t*	P	Beta	*t*	P
Relational	-0.245	-3.503	0.001*	0.298	4.289	0.000*
Structural	-0.225	-3.221	0.002*	0.209	3.017	0.003*
Cognitive	-0.109	-1.552	0.122	0.055	0.791	0.430
R		0.353			0.378	
R^2		0.124			0.138	
Adjusted R^2		0.110			0.123	
F		8.468			9.537	
Significance F		0.000			0.000	
Durbin-Watson		1.678			1.809	

# P<0.1; ‡ P<0.05; * P<0.01

5.3.2.4 Relational dimension and behavior response after SARS outbreak

The dimensions of ‘relational’ and ‘anxiety’ have positive relationship and are correlated to each other. Therefore it matched to the hypothesis of this study and H6a is established. The dimensions of ‘relational’ and ‘confidence’ have positive relationship and are correlated. Therefore it matched to the hypothesis of this study and H6b is established.

5.3.2.5 Structural dimension and behavior response after SARS outbreak

The dimensions of ‘structural’ and ‘anxiety’ have positive relationship and are correlated to each other. Therefore it matched to the hypothesis of this study and H7a is established. The dimensions of ‘structural’ and ‘confidence’ have positive relationship and are correlated to each other. Therefore it matched to the hypothesis of this study and H7b is established.

5.3.2.6 Cognitive dimension and behavior response after SARS outbreak

The dimensions of 'cognitive' and 'anxiety' have negative relationship. Therefore it did not match to the hypothesis of this study and H8a was not established. The dimensions of 'cognitive' and 'confidence' have negative relationship. Therefore it did not match to the hypothesis of this study and H7b was not established.

Table 19 **Comparison of the hypotheses and empirical study results of social capital and behavioral response after SARS outbreak**

Social Capital	**Anxiety**		**Confidence**	
	Hypothesis	*Result*	*Hypothesis*	*Result*
Structural	- (H8a)	-	+ (H8b)	+
Relational	- (H9a)	-	+ (H9b)	+
Cognitive	- (H10a)	-	+ (H10b)	+

'+' positive relationship

'-' negative relationship

Chapter 5 Conclusion

5.1 The relationship between 'OCBs' and 'social capital'

5.1.1 The influence of 'loyalty and obedience' to 'social capital'

5.1.1.1 'Loyalty and obedience' offers no significant influence to 'Structural Social Capital'

The positive response of the medical personnel to the dimension of 'loyalty and obedience' is due to high regard and respect to their field of work, hospital or organization that's why majority of the medical personnel are loyal to their work and abide the rules and regulations promulgated by the hospital or organization. They are willing to contribute extra time, effort and spirit for the betterment of the hospital or organization. The 'structural social capital' only pertains to the close interpersonal relationships among personnel and it does not affect one's quality of work and offers no effective work functioning nor benefits for the improvement of the hospital or organization. Therefore, the dimension of 'loyalty and obedience' does not influence the results of structural social capital.

5.1.1.2 Loyalty and obedience offers no significant influence to relational social capital

The dimension of 'relational social capital' pertains to the

mutual trust and reliance among personnel. The results show that colleagues are willing to help each other, be it personal or at work, and are confident enough that colleagues will not harm nor hurt them in any other way. However, the motivation of positive responses of the majority of personnel to 'relational social capital' is related more on their personal trust and care within staffs and is not attributed to the development of good work performances or betterment of their quality of work. Therefore, the responses of medical personnel to the dimension of 'loyalty and obedience' do not influence the 'relational dimension' of social capital.

5.1.1.3 Loyalty and obedience has significant influence to cognitive social capital

The dimension of 'cognitive social capital' pertains to one's ability to perceive the same ideas, visions, common goals and ambitions. Majority of the hospitals in this study have its own recognized medical schools and organization; they absorb and retain their staffs/personnel explicitly set forth by the schools and organizations. That's why, most of the personnel of every hospital department are schoolmates or of the same peers. Since the medical personnel participated in this study come from the same root and exhibit the same vision, and common goal, they are most likely to behave and become loyal and obedient to the hospital and work hard

to obtain the same ideal. Thus, 'loyalty and obedience dimension' directly influence the 'cognitive social capital' significantly.

5.1.2 The influence of 'supportive and cooperation' to 'social capital'

5.1.2.1 'Supportive and cooperation' significantly influence the 'structural social capital'

Majority of the personnel are seen as supportive and cooperative in the sense that they are willing to assist their colleagues without restraint. They are even happy to help new colleagues to psychologically adapt to a new environment. They are also very open to discussion and offer intentions of cooperating with other department staffs in order to accomplish a mission for the betterment of the hospital. As a result, larger 'network ties' are then established and thereby improvement of the 'configuration and density of ties' are obtained. As Coleman (1990) have stated," the transfer of information or knowledge within an organization is more likely to occur when employees are interconnected". Therefore, the 'supportive and cooperation' dimension enhances the effectiveness of 'social capital.

5.1.2.2 'Supportive and cooperation' significantly influence the 'relational social capital'

Since the personnel's responses show a sense of mutual trust and respect to each other, they then develop an increase willingness of support and cooperation with one another and thereby bring forth to a comfortable workplace. Therefore, any intention, motive or aim of one individual or peer is directly affecting or influencing the compliance or cooperation of another peer or individual.

5.1.3 The influence of 'functional participation' to 'social capital'

5.1.3.1 'Functional participation' shows significant influence to 'structural social capital'.

Majority of the medical personnel are noted as helpful and accommodating to their patients and hospital needs. They are also eager to put extra effort and time for the improvement of the hospital. As a result of this positive behavior, they tend to extend their help beyond their work fields and tend to indulge also in structural aspect of social affairs. Thus, 'functional participation' influences 'structural social capital'.

5.1.3.2 'Functional participation' shows significant influence to relational social capital

This study shows mutual trust, respect and good intentions of medical personnel to each other; as a result, they work together without limitation in achieving a common goal. Hence, 'functional participation influences relational aspect of social capital.

5.1.3.3 'Functional participation' has not significant influence to 'cognitive social capital'.

Although most of the medical personnel are schoolmates which share the same ideal and common goal, results show that their intentions are mainly for the betterment of the hospital and not for the benefits of their peers or colleagues. Thus, there is no significant influence between functional participation and cognitive social capital.

5.1.4 The influence of 'social participation' to 'social capital'

5.1.4.1 Social participation shows significant influence to structural social capital

Medical personnel do participate in any hospital's social activities as a way to improve their quality of life and as a leisure activity which in turn, develops a closer tie with colleagues and family

members thereby improving their relationship and camaraderie with each other. Thus, social participation influences significantly the structural social capital.

5.1.4.2 Social participation shows no significant influence to relational social capital

Although majority of the personnel are of help to each other and like each other, they do not seem to show the same interests in any particular social activity thus, no correlation between social participation and relational social capital.

5.1.4.3 Social participation shows significant influence to cognitive social capital

This study shows a positive correlation between social participation and cognitive social capital because medical personnel of the same ideals and common goals, generally flock together to achieve better performances and hence, they participate and share social activities to enhance their common thoughts.

5.1.5 Summary of the influence of OCBs to 'social capital'

The 'supportive and cooperation' and 'functional participation' are effective in influencing the structural and relational social capital. The cognitive social capital is only influencing the 'loyalty and obedience'

and ‘social participation’.

5.2 The relationship between ‘social capital’ and ‘behavioral response’ during SARS spreading

5.2.1 The influence of ‘relational social capital’ to ‘behavioral response

5.2.2.1 Relational social capital has significant influence to anxiety and confidence

During SARS outbreak, every individual′s clinical condition is at risk because we all know that SARS is a life threatening disease. During this time, majority of the medical personnel suffered from psychological breakdown and anxiety because they may be criticized or discriminated by other peers or relatives for fearing that they are also infected by SARS.

But if medical personnel all work together and offer support, mutual help and willingness to lend a helping hand in combating the SARS, then the fear of anxiety will then reduced and thereby will be successful in combating the disease. At the same time the confidence is also increased.

5.2.2 The influence of ‘structural and cognitive social capital’ to ‘behavioral response’

5.2.2.1 Structural and cognitive social capital have no significant influence to anxiety and confidence

The structural and cognitive dimensions only relate to the general relation within the organization. They cannot guarantee that their colleagues would like to take the risk or share the trouble. Thus the anxiety cannot be released by structural social capital and it is hard to increase their confidence.

5.2.3 Summary of the influence of ‘social capital’ to ‘behavioral response’ during SARS outbreak

During SARS outbreak, only relational social capital can decrease anxiety and increase confidence in the medical profession team.

5.3 The relationship between ‘social capital’ and ‘behavioral response’ after SARS outbreak

5.3.1 The influence of ‘relational and structural social capital’ to ‘behavioral response’

5.3.1.1 Relational and structural social capital has significant influence to anxiety and confidence

After SARS outbreak, it is also a stage of recovery from the crisis. The medical personnel know well each other as a result of experience from SARS outbreak. They now know who their friends are who will truly help them in times of crisis. Thus the structural and relational social capital can decrease anxiety and increase confidence.

5.3.2 The influence of ‘cognitive social capital’ to ‘behavioral response'

5.3.2.1 Cognitive social capital has no significant influence to anxiety and confidence

After SARS outbreak, they will know who their true friends are. Colleagues of the same school which have the same goal, ambition and ideal in life do not necessarily mean that they support and help each other in times of crisis. Hence, cognitive social capitals will not the decrease anxiety nor increase confidence.

5.3.3 Summary of the influence of ‘social capital’ to ‘behavioral response’ after SARS outbreak

After SARS outbreak, the structural and relational social capital can decrease anxiety and increase confident.

5.4 Integrated discussion of OCBs, social capital and behavior response

The ‘supportive and cooperation’ and ‘functional participation’ of OCBs can positive and significantly influence the structural and relational social capital. The cognitive social capital is only influenced by ‘loyalty and obedience’ and ‘social participation’.

During the SARS outbreak, only the ‘relational social capital’ can decrease anxiety and increase confidence’. After the SARS outbreak, the ‘relational and structural social capital’ can decrease SARS and increase confidence.

Chapter 6 Discussion

6.1 The dimension of 'supportive and cooperation' is a major factor in increasing the 'structural and relational capital'

In 1991, Graham suggested that there are 3 forms of organizational citizenship behavior which consists of 'loyalty', 'obedience' and 'participation' but in 1994, in subsequent empirical work of Van Dyne, Graham and Dienesch, indicated that 'participation' actually takes another three forms which consists of 'social participation', 'advocacy participation' and ' functional participation'. In this study, several forms of organizational citizenship behavior are also advocated to determine the responses of medical personnel which consists of 'loyalty and obedience', 'supportive and cooperation', 'functional participation', and 'social participation'.

According to past literature reviews, OCBs play an important role in the development of social capital because OCBs contribute to the creation of structural, relational, and cognitive aspects of social capital (Bolino, Turnley, and Bloodgood, 2002). But in this study, the results show that the 'loyalty and obedience' dimension of citizenship behavior is not effective in promoting the 'structural and relational' social capital

because the respondents participated in this study are all medical personnel who possess high levels of academic background and independent thinking competency. Moreover, the respondents are always exposed to outside domain in their daily work in order cultivate and exchange viewpoints for medical use, professional and personal improvement. So, bearing this kind of status in mind, they do not easily obey or be loyal to anything that offers no humanitarian benefit. But majority of these personnel are very supportive and cooperative for the betterment of the hospital and improvement of their colleagues.

It was also found out that in this study, 'Supportive and cooperation' and 'functional participation' behaviors are positively associated with the creation of 'structural' and 'relational' social capital, the same result seen in the previous study made by Graham et al, 1994. But it was also found out that 'support and cooperation' behavior is more effective than 'functional participation' behavior in facilitating the creation of 'structural' and 'relational' social capital.

6.2 The 'social participation' is the unique dimension to increase the 'cognitive capital'

As Feldman (1984) suggested, "participation in nonmandatory social events is one of the principal means by which employees

become socialized to their organizations". When an employee participates in any social activity, he or she tends to develop an ability to communicate with colleagues more effectively through problem discussions, exchange of ideas and knowledge sharing. This in turn, is an asset that increases the ability of employees to coordinate with one another and thereby reduces grudges between employees. Therefore, social participation will enhance cognitive social capital through the development of common language and shared narratives among employees.

6.3 The relational dimension can decreases anxiety and increase confidence during SARS outbreak

SARS is a life-threatening infectious disease. The afflicted and the attending medical personnel are usually put into isolation for several weeks before they are cleared and considered SARS free. It is during this period where a stress is being endured both by the afflicted and the rescuer. A stress, or more properly, a stressor, is an external pressure which is brought to bear upon the individual. Being anxious is often roughly equated to being 'in state of stresses'. Therefore anxiety is a normal human response to stress.

It is clear that a good rapport and camaraderie between colleagues

will induce mutual support for each other and thereby overcoming the difficulties with ease. Likewise, relational social capital might be especially important when there is a high degree of task interdependence among employees (Bolino, Turnley, and Bloodgood, 2002).

6.4 The relational and structural dimensions can decrease the anxiety and increase the confidence respectively after the SARS outbreak.

After the SARS outbreak, a lesson that was put to mind is that fighting SARS alone will not topple down this deadly, contagious disease but rather, multiple efforts and cooperation among the medical staffs and government aides are needed to combat SARS and in order to prevent the spread of the infectious disease and its recurrence. Thus, medical personnel need to improve the relationship among each other by increasing the number of ties among individuals in an organization, altering the configuration of connections and contacts within an organization in important ways, and facilitating the development of contacts between individuals in some settings (Bolino, Turnley, and Bloodgood, 2002). Furthermore, the medical personnel understand that the transfer of information or knowledge within an organization is more likely to occur when employees are interconnected (Coleman, 1990).

While they have the relational advantages, they need to promote it by structural dimension.

6.5 No gender difference

It has already been proven in the preliminary statistics that gender difference offer no statistical significance.

6.6 Limitation of this research

Although most of the medical personnel in this study have direct contact with SARS patients, however, no one has been reported to have acquired or infected by SARS. The true level of respondents' anxiety and confidence as compared with those who truly acquired the infection cannot be measured in this research.

Although none of the respondents who participated in this research is working in Taipei Municipal Hoping Hospital（臺北市立和平醫院), which is the center of SARS attack, the respondents who participated in this research are all working in one of the medical hospitals in Taiwan and have direct contact with SARS patients.

Chapter 7: Suggestion

7.1 Managerial Implication

7.1.1 OCBs can increase social capital

The ‘supportive and cooperation or ‘functional participation’ of OCBs may influence the ‘structural’ and ‘relational’ social capital simultaneously. Thus, if we want to improve the social capital by OCBs, the ‘supportive and obedience’ or ‘functional participation’ should be the most effective choice. Then the cognitive may be improved by loyalty and obedience and social participation.

In order to enhance the dimension of ‘supportive and cooperation’ behavior of medical personnel, the hospital or organization may undergo certain measures like:

1. The hospital should offer and release more financial resources, manpower resources or instruments to aid employees in delivering task efficiently.
2. The hospital must present rewards, benefits and bonuses routinely to qualified medical personnel who truly dedicate themselves to work.
3. The hospital must also establish rapport and camaraderie between fresh man colleagues and senior colleagues so that senior colleagues can help them to adapt to this new environment.

4. The hospital must provide means to promote emotional support in order to encourage every medical personnel to help or assist each other.

7.1.2 Relational social capital can decrease anxiety and increase confidence during SARS outbreak

In order to reduce anxiety and increase confidence of medical personnel during crisis, the hospital or organization should promote and improve the relational social capital.

7.1.3 Relational and structural social capital can decrease anxiety and increase confidence after SARS outbreak

Although this is a post-crisis period, the hospital must continue to provide means to improve both the relational and structural social capital in order to re-establish confidence and to erase anxiety.

7.2 Directions of the future research

7.2.1 Future study the medical personnel who infected with SARS

Since this study encompasses only those that are not infected by SARS, future study must be done to include personnel who are truly infected with SARS.

7.2.2 Compare the OCBs and social capital of medical personnel in different districts, such as Hong Kong, Singapore and Canada.

The medical personnel of different districts show different behavioral response. The future study must be done to find out the best OCBS and social capital that induce the best behavioral responses that the citizens expect.

7.2.3 Compare the different behavior responses by different disasters, such as Avian Influenza (Bird Flu) outbreak.

The Avian influenza is an ongoing high mortality infection to human being and more severe than SARS. Future study must also be done to

cover the study of other crisis or disasters.

Reference

1. Anonymous, ***Morbidity and Mortality Weekly Report (MMWR)***. 2002. September 11 (special Issue), 51:1-5
2. Arrow, KK. 1974. ***The limits of organization***. New York: Norton.
3. Baker, W. 1990. Market networks and corporate behavior. ***American Journal of Sociology***, 96:589-625.
4. Brett M. McDermott, Lyle J. Palmer. 2002. Postdisaster emotional distress, depression and event-related variables: findings across child and adolescent developmental stages. ***Australian and New Zealand Journal of Psychiatry***. 36:754-761.
5. Boisot, M. 1995. ***Information space: A framework for learning in organizations, institutions and culture. London***: Routledge.
6. Boland, r. J., Tenkasi, R. V. 1995. Perspective making and perspective taking in communities of knowing. ***Organization Science***, 6:350-372.
7. Bolino, Turnley, and Bloodgood. 2002 Citizenship behavior and the creation of social capital in organization, ***Academy of Management Review***, 27 (4): 505-522.
8. Bolon Douglas S. 1997. Organizational citizenship behavior among hospital employees: a multidimensional analysis involving job satisfaction and organizational commitment. ***Hospital and Health Services Administration***. 42(2): 221-241.
9. Bolon Douglas S. 1999. Level of analysis considerations in organizational citizenship behaviour research: an empirical investigation of individual and work group effects among hospital employees. ***Health Services Management Research***. 12: 92-108.
10. Bourdieu, P. 1986. The forms of capital. In J. G. Richardson (Ed.), ***Handbook of***

theory and research for the sociology of education: 241-258. New York: Greenwood.

11. Bouty, I. 2000. Interpersonal and international influences on informal resource exchanges between R&D researchers across organizational border. ***Academy of Management Journal***. 43:50-65.
12. Brennan, L., Sage F. J., and Simpson A, 1994. Major incident planning in South East Thames Region: a survey of medical staff awareness and training. ***Journal of accident and emergency medicine***, June 11(2): 85-89.
13. Burt, R.S. 1992. ***Structural holes: The social structure of competition***. Cambridge, MA: Harvard University Press.
14. Campion, M. A., Papper, E. M., & Medsker, G. J. 1996. Relations between work team characteristics and effectiveness: a replication and extension. ***Personnel Psychology***. 49:429-452.
15. Cicourel, A. V. 1973. ***Cognitive sociology***. Harmondsworth, England: Penguin Books.
16. C.L. Katz et al. Psychiatry Research. 2002. ***Psychiatry Research.*** 110:201-217.
17. Coleman, J. S. 1988. Social capital in the creation of human capital. ***American Journal of Sociology***, 94:S95-S120.
18. Coleman, J. S. 1990. ***Foundations of social theory***. Cambridge, MA: Harvard University Press.
19. Coleman Venetta I. & Borman Walter C. 2000. Investigating the underlying structure of the citizenship performance domain. ***Human Resource Management Review***. 10(1)25-44.
20. Diane Irvine. 1995. The development of measures of organizational citizenship behaviour and changes in job behaviours related to quality management in health care. ***Health Services Management Research***. 8(3) Augest:143-161.

21. Diana Keable, 1997. ***The management of Anxiety: A guide for therapists***. Churchill Livingstone.

22. Dyne Linne Van, Graham Jill W. & Dienesch Richard M, 1994. Organization citizenship behavior: construct redefinition, measurement, and validation. ***Academy of Management of Journal.*** 37(4)765-802.

23. Epstein, R.S., Fullerton, C.S., Ursano, R.J. 1998. Posttraumatic stress disorder following an air disaster: a prospective study. ***American Journal Psychiatry.*** 155, 934-938.

24. Feldman, D. C. 1984. The development and enforcement of group norms. ***Academy of Management Review***, 9: 47-53.

25. Fisher, S. R., & White, M. A. 2000. Downsizing in a learning organization: Are there hidden costs? ***Academy of Management Review***, 25: 244-251.

26. Graham, J. W. 1991. An essay on organizational citizenship behavior. ***Employee Responsibilities and Rights Journal***, 4: 249-270.

27. Granovetter, M.S. 1992. Problems of explanation in economic sociology. In N. Nohria & Eccles (Eds.), ***Networks and organizations: Structure, form and action***: 25-56. Boston: Harvard Business School Press.

28. Injuries and illness among New York City fire Department Rescue Workers after responding to the World Trade Center Attacks. ***Morbidity and Mortality Weekly Report***, 2002 (September, 11), 51:1-5.

29. Jacobs, J. 1965. ***The death and life of great American Cities***. London: Penguin Books.

30. James N. Burdine, Michael R.J. Feliz, Nina Wallerstein, Amy L. Abel, Charles J. Wiltraut, Yvette J. Musselman, and Chris Stidley. 1999. Measurement of Social Capital. ***Annals of the New York Academy of Sciences***. 896:393-395.

31. Jones, G. R., & George, J. M. 1998. The experience and evolution of trust:

Implications for cooperation and teamwork. ***Academy of Management Review***, 23(2):531-546.

32. Krackhardt, D. 1992. The strength of strong ties. In N. Nohria & R. G. Eccles (Eds.), ***Networks and organizations: Structure, form and action***: 216-239. Boston: Harvard Business School Press.
33. Krackhardt, D., & Hanson, J. R. 1993. Informal networks: ***The company behind the chart***. Harvard Business Review, 71(4):104-111.
34. Kramer, R. M., Brewer, M. B., & Hanna, B. A. 1996. Collective trust and collective action: The decision to trust as a social decision. In R. M. Kramer & T. R. Tyler (Eds.), ***Trust in organizations. Frontiers of theory and research***: 357-389. Thousand Oaks, CA.: Sage.
35. Loury, G. 1987. Why should we care about group inequality? ***Social Philosophy & Policy***. 5:249-271.
36. Maes M. et al. 2001. Pre-and post-disaster negative life events in relation to the incidence and severity of post-traumatic stress disorder, ***Psychiatry Research*** 105:1-12.
37. Mayer, R. C., J. H., & Schoorman, F. D. 1995. An integrative model of organizational trust. ***Academy of Management Review***. 20: 709-734.
38. McDermott Brett M., Palmer Lyle J., 2002. ***Australian and New Zealand Journal of Psychiatry***, 36:754-761.
39. Mishira, A. K. 1996. Organizational responses to crisis. The centrality of trust. In R. M. Kramer & T. M. Tyler (Eds.), ***Trust in organizations***: 261-287. Thousand Oaks, CA: Sage.
40. Misztal, B. 1996. ***Trust in modern societies***. Cambridge, England: Polity Press.
41. Monteverde, K. 1995. ***Applying resource-based strategic analysis: making the model more accessible to practitioners***. Working Paper No.65-1, Department of

Management and Information Systems, St. Joseph's University, Philadelphia.

42. Morgan, G. 1986. ***Images of organization***. Beverly Hills, CA: Sage
43. Morrison Elizabeth Wolfe, 1994. Role definitions and organizational citizenship behavior: The important of the employee's perspective. ***Academy of Management Journal***. 37(6)1543-1567.
44. Nahapiet J. & Ghoshal S. 1998. Social capital, intellectual capital, and the organizational advantage, ***Academy of Management Review***, 23(2):242-266.
45. Norhria, N. 1992. Information and search in the creation of new business ventures: The case of the 128 Venture Group. In N. Norhria & R. G. Eccles (Eds.), ***Networks and organizations: Structure, form, and action***: 240-261. Boston: Harvard Business School Press.
46. Organ, D. W. 1988. ***Organizational citizenship behavior: The good soldier syndrome***. Lexington, MA: Lexington Books.
47. Organ, D. W., & Ryan, K. 1995. A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. ***Personnel Psychology***, 48: 775-802.
48. Orr, J. 1990. Sharing knowledge, celebrating identity: Community memory in a service culture. In D. Middleton & D. Edwards (Eds.), ***Collective remembering***: 169-189. London: Sage.
49. Philip L.H. Yu, 2003, Lessons from Taiwan, JAMC, 169(4)277-278.
50. Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., & Bachrach. D. G. 2000. Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. ***Journal of Management***, 26:513-563.
51. Putnam, R. D. 1995. Bowling alone: America's declining social capital. ***Academy of Democracy***. 6:65-78.

52. Reijneveld Sijmen A, Crone Mathilde R, Verhulst Frank C Verloove_Vanhorick S Pauline, 2003, August. The effect of a severe disaster on the mental health of adolescents: a controlled study. ***The Lancet***. 362(30)691-696.

53. Rioux S. M. & Penner Louis A. 2001. The causes of organization citizenship behavior: A motivational analysis. ***Journal of Applied Psychology***. 86(6), 1306-1314.

54. Rose M. A. and Larrimore K. L., 2002. Knowledge and awareness concerning chemical and biological terrorism: continuing education implications. ***The journal of continuing education in Nursing***. 33(6):253-258.

55. Severe Acute Respiratory Syndrome (SARS), ***Weekly Epidemiological Record***. 2002. 78(21):181-188.

56. Shah, P. P. 2000. Network destruction: The structural implications of downsizing. ***Academy of Management Journal***, 43:101-112.

57. Sims, A. and Sims D, 1998. The phenomenology of post-traumatic stress disorder. A Symptomatic study of 70 victims of psychological trauma. ***Psychopathology***. 31(2):96-112.

58. Shiing-Jer Twu, et al., Control Measures for Severe Acute Respiratory Syndrome (SARS) in Taiwan, ***Emerging Infectious Diseases***, 2003, 9(6):718-720.

59. Smith, C. A., Organ, D. W., and near, J. P. 1983. Organizational citizenship behavior: Its nature and antecedents'. ***Journal of Applied Psychology***. 68(4):655-653.

60. Tjemsland, L., Soreide, J.A., Malt, U.F. 1998. Posttraumatic distress symptoms in operable breast cancer III: status one year after surgery. ***Breast Cancer Research and Treatment*** 47, 141-151.

61. Van Dyne, L., Graham, J. W., & Dienesch, R. M. 1994. Organizational citizenship behavior: Construct redefinition, measurement, and validation. ***Academy of Management Journal***, 37: 765-531.

62. Wit, A. P., & Wilke, H. 1992. The effect of social categorization on cooperation in three types of social dilemmas. ***Journal of Economic Psychology***. 13:135-151.

63. Xiangdong Wang, Lan Gao, Huabiao Zhang, Chengzhi Zhao, Yucun Shen, and Naotaka Shinfuku. 2000. Post-earthquake quality of life and psychological well-being: Longitudinal evaluation in a rural community sample in northern China. ***Psychiatry and Clinical Neurosciences***. 54: 427-433.

Questionnaires

敬愛的醫護同仁：

您好！此問卷的目的是從「人力資源」角度來探討 SARS 對同仁近來的心理影響，本研究為純學術性之研究，結果將以整體性呈現，敬請放心回答。在此，由衷感謝您撥冗填寫。

敬祝 萬事如意 身體健康

東海大學管理學院 EMBA 指導教授：張國雄博士 研究生：陳萬宜 (台中榮總 牙科部 口腔顎面外科 電話- (04)2359 2525 #5508 Email: c3883@vghtc.gov.tw)	（感謝協助單位） 台中榮總精神部 林志堅 醫師 陳展航 主任

基本資料：

1. 性別：□男 □女
2. 年齡：□25 歲以下 □26-30 歲 □31-35 歲 □36-40 歲 □41 歲以上
3. 教育程度：□高中 □專科 □學士 □碩士 □博士 □其他_____
4. 科別：□急診 □ICU □呼吸治療或胸腔內科 □麻醉
5. 職等：□護士 □護理長 □護理督導、主任
   □住院醫師 □主治醫師 □主任醫師
6. 接觸 SARS 病史：□照顧過 SARS 病人
   □曾接觸過 SARS 病人或疑似 SARS 的病人
   □無
7. 本身出現過 SARS 症狀：□有 □無
8. 曾接受隔離：□有 □無

請翻至背面

共兩頁、四面

下列問題是詢問您在貴醫院工作時，是否有下列行為？	非常同意	同意	普通	不同意	非常不同意
9. 我會以本院整體利益為重，必要時可犧牲個人的利益	□	□	□	□	□
10. 我願意對醫院犧牲奉獻・・・・・・・・・・・・・・	□	□	□	□	□
11. 即使本院遇到重大困難，我仍願意繼續留在醫院工作	□	□	□	□	□
12. 我會認同、支持、保護醫院的目標・・・・・・・・	□	□	□	□	□
13. 不管本院的規定如何，我不會抱怨或抨擊・・・・・	□	□	□	□	□
14. 即使無人注意，我會隨時遵守本院的規定・・・・・	□	□	□	□	□
15. 我經常不遵守醫院的規定和程序(R)・・・・・・・・	□	□	□	□	□
16. 我會提供病患其他額外的服務或協助・・・・・・・	□	□	□	□	□
17. 我願意付出額外的努力，以協助本院渡過難關・・・	□	□	□	□	□
18. 我願意投入額外的時間在本院的事務上・・・・・・	□	□	□	□	□
19. 即使無額外酬勞，我會主動加班完成工作・・・・・	□	□	□	□	□
20. 我會主動協助新進同仁，適應工作環境・・・・・・	□	□	□	□	□
21. 我樂於協助同事解決工作方面困難・・・・・・・・	□	□	□	□	□
22. 我樂於與別單位成員一起合作，達成任務・・・・・	□	□	□	□	□
23. 我樂於協助本院內其他成員・・・・・・・・・・・	□	□	□	□	□
24. 我努力自我充實，以提升工作品質・・・・・・・・	□	□	□	□	□
25. 我會參與醫院內的一些聯誼活動・・・・・・・・・	□	□	□	□	□
26. 我會熱心發起或積極參與本院的各種活動，以促進同事感情・・・・・・・・・・・・・・・・・・・・・・	□	□	□	□	□
27. 我會參與醫院內的一些休閒活動・・・・・・・・・	□	□	□	□	□

請翻至下頁

下列問題是詢問您與所屬單位同事間的一些相處狀況	非常同意	同意	普通	不同意	非常不同意
28. 我經常參加本單位舉辦之聯誼活動・・・・・	□	□	□	□	□
29. 我認識同事的家人・・・・・・・・・・・・	□	□	□	□	□
30. 我認識同事的好朋友・・・・・・・・・・・	□	□	□	□	□
31. 當我需要幫忙時, 同事一定樂意伸出援手・・・	□	□	□	□	□
32. 我與同事間不會有損害對方利益之行為・・・	□	□	□	□	□
33. 我與同事間之合作, 從不擔心會被佔便宜・・・	□	□	□	□	□
34. 我與同事間均認為彼此是可靠的工作夥伴・・	□	□	□	□	□
35. 我與同事之間不會打小報告・・・・・・・・	□	□	□	□	□
36. 我與本科同事大部份有同校的關係・・・・・	□	□	□	□	□
37. 我與同事會彼此分享願景與抱負・・・・・・	□	□	□	□	□
38. 我與同事會為追求共同的理想而努力・・・・	□	□	□	□	□
39. 我經常與同事討論醫學專業知識（或業務上的心得）・・・・・・・・・・・・・・・・・・・・	□	□	□	□	□
40. 我經常與同事討論最近的社會事件、生活流行趨勢或財經消息・・・・・・・・・・・・・・・	□	□	□	□	□

請翻至背面

下列問題是詢問您對貴醫院的一些看法

	非常同意	同意	普通	不同意	非常不同意
41. 本院很重視績效及業績・・・・・・・・・・	□	□	□	□	□
42. 本院之醫師有較大的業績壓力・・・・・・・	□	□	□	□	□
43. 本院同仁感情較佳、相處比較和諧・・・・・	□	□	□	□	□
44. 本院同仁皆能相互合作與配合・・・・・・・	□	□	□	□	□
45. 本院有繁雜的行政程序・・・・・・・・・・	□	□	□	□	□
46. 本院官僚氣息濃厚・・・・・・・・・・・・	□	□	□	□	□
47. 本院很重視病人的滿意度・・・・・・・・・	□	□	□	□	□
48. 本院會積極處理病人的投訴或檢舉・・・・・	□	□	□	□	□

下列問題是詢問您在SARS流行期間(自和平醫院封院至高雄長庚封院)，與目前在心理上的一些感受

	SARS流行時期						目前（SARS流行之後）					
	非常同意	同意	普通	不同意	非常不同意		非常同意	同意	普通	不同意	非常不同意	
49. 我會感到精疲力倦・・・・・・	□	□	□	□	□		□	□	□	□	□	58.
50. 我會有心力交瘁的感覺・・・・	□	□	□	□	□		□	□	□	□	□	59.
51. 我會有逃避工作的想法・・・・	□	□	□	□	□		□	□	□	□	□	60
52. 我很擔心會感染SARS・・・・	□	□	□	□	□		□	□	□	□	□	61.
53. 上班時我會很緊張・・・・・・	□	□	□	□	□		□	□	□	□	□	62.
54. 我會無故覺得恐慌・・・・・・	□	□	□	□	□		□	□	□	□	□	63.
55. 我自信能處理SARS病患・・・	□	□	□	□	□		□	□	□	□	□	64.
56. 我相信本院同仁可以共同合作對抗SARS・・・・・・・・・・	□	□	□	□	□		□	□	□	□	□	65.
57. 我認為SARS並不是那麼可怕・	□	□	□	□	□		□	□	□	□	□	66.

完了

謝謝您！