

Correspondence

Does Organizational Culture Impact Patient Safety Management?

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ABSTRACT

Objective: Since organizational culture could act as a tool to socialize employee value, this study explores the relationship between organizational culture and patient safety management, with the purpose of identifying which culture could benefit from the implementation of patient safety. *Method:* Based on the theory of Competing Values Approach, this study adopted four categories of organizational culture (rational culture, developmental culture, group culture and hierarchical culture) and a self-devised questionnaire on patient safety. The survey questionnaires were distributed to doctors, nurses, medical and administrative staff at five medical centers in northern Taiwan. A total of 181 completed questionnaires were returned. *Results:* (1) Multiple types of organizational culture were displayed, with the four categories of culture co-existing and having correlations of different strengths. (2) The correlation between rational culture and patient safety management was found to be negatively statistically significant. (3) Developmental culture, group culture and hierarchical culture were found to have statistically significant associations with patient safety management. *Conclusion:* Overall, group culture has the greatest impact on patient safety management. Development and hierarchical cultures have an impact only on some aspects of patient safety management. Therefore, in developing and promoting patient safety, group culture should be cultivated to aid the introduction of the patient safety management.

Key words: patient safety management, organizational culture, competing values approach.

1. INTRODUCTION

In November 1999, the Institute of Medicine (IOM) in the United States of America estimated that from 44,000 to 98,000 people died each year as a result of medical errors. At the same time, the financial damage that resulted from medical errors was estimated at US\$17 billion to US\$29 billion (Kohn, Corrigan & Donaldson, 2000). Like nuclear generator plants, as well as the aviation industry and chemical industry, medical institutions are considered high-risk industries. However, when compared to the large volume of media attention and reports sparked off by aviation accidents, it is generally believed that mistakes committed by medical institutions are underreported. This is largely because cases are sporadic and the attribution of mistakes is unclear, hence attracting less attention (Gaba, 2000). Although less attention is paid to the problem, it continues to exist and patients accepting medical care will forever bear uncertain risks as long as the problem remains. According to the literature, organizational characteristic factors

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such as organizational culture, leadership style and the degree of leader involvement, communication systems, participation of patients and families, and human resource management methods (Firth-Cozens, 2001; Wakefield et al., 2001; Nieva & Sorra, 2003; Pronovost, Weast & Holzmueller, 2003; Singer et al., 2003; Flin & Yule, 2004; Hoff, Jameson, Hannan & Flink, 2004; Rockville, Sorra & Nieva, 2004; Wong & Belglaryan, 2004; Singer & Tucker, 2006) could all affect the successful implementation of patient safety. Among them, organizational culture is the most important factor. This is because the spread of culture by word-of-mouth, role models and other considerations, can communicate the behavior and attitudes that the organization prefers or expects (Schein, 1992). Therefore, through organizational culture, organizations can create the most desirable behavior (Davies, 2000), which includes the requirement for a safe patient environment. Patient safety is defined as the avoidance, prevention and amelioration of undesirable events or harm that can occur in the treatment process. These undesirable events are made up of terms such as errors, risk, hazard, healthcare associated injuries, near mistakes, adverse events, negligence, deviation and accident (Gaba, 2000; Battle & Lilford, 2003). Since patient safety is designed to prevent undesirable events, management should be implemented to ensure the overall success of safety.

This study focuses on four dimensions of safety management, that is: leadership (Kohn et al., 2000), teamwork (Sally & Donaldson, 1998), voluntary incident reporting (Wachter et al., 2002; Tamuz, Thomas & Franchois, 2004), and education and training (Firth-Cozens, 2001; Pronovost et al., 2003). Based on these four dimensions, this study proposes a relationship between organizational culture and patient safety management.

The importance of organizational culture lies in its omnipresence. It could be the glue that binds the organization together (Deal & Kennedy, 1982) or it could set the boundaries for the values and behavior of its members (Rousseau, 1990). It could even play the role of societal control in clarifying or understanding if the conduct and attitude displayed by organizational members is appropriate (O'Reilly & Chatman, 1996). Therefore, the role of culture in an organization is very important, particularly when it comes to implementing new policies that require culture to drive and shape them (Sally & Donaldson, 1998; Kohn et al., 2000). Organizational culture here is defined as: the hypotheses developed by specific organizations that are learnt from solving problems such as how to adapt to external environments and conform to internal conditions. Besides being imparted to new members of the organization, these hypotheses are used to make adjustments to the way workers think (Schein, 1992). Although organizational culture is a way of learning how to adapt to external environments and gain internal conformity, the circumstances faced by every organization and the problems they deal with are not entirely the same, which results in very different cultures being developed. Therefore, organizational culture enables members to learn from errors and shape shared values through socialization. Various scholars have different ways of approaching the concept of organizational culture. For instance, O'Reilly categorized organizational culture into components such as creativity, stability,

respect, result-orientation, detail emphasis, team-orientation and activeness and so on (O'Reilly & Chatman, 1996), and used Q-sort to make it compulsory for interviewees to rank the options for culture. There is also Enz's method of using the legitimacy of organizations to define culture (Enz, 1988), and the evaluation framework for organizational culture developed by Quinn and Spreitzer on the basis of the Competing Values Approach (CVA) (Quinn & Spreitzer, 1991). The CVA demonstrates a two-dimensional approach (one is internal focus versus external focus, the other is stability and control versus flexibility and changes) to differentiate the four types of organizational culture which include rational culture (stability and external focus), developmental culture (flexibility and external focus), group culture (flexibility and internal focus), and hierarchical culture (stability and internal focus). One advantage of the CVA is that it views organizational culture as multi-dimensional and not simply existing in a single form. CVA is thus suitable for use in studying the in-depth framework of organizational culture (Cameron & Quinn, 1999). As the CVA is developed based on the theory that has been tested for reliability in different research studies (Howard, 1998), this study adopts the CVA scale to measure culture.

The key trait of rational culture organization is emphasis on matters of external environment rather than internal matters. This leads to the organization's main operation mechanism being placed on economic considerations and likewise on competitiveness and productivity (Cameron & Quinn, 1999). The bond between organizational members in a rational culture is built on profit motives and the internal competition being tough, resulting in organizational members being more task-oriented. Such a model could be the consequence of the leader's emphasis on results and achievement of goals, but without considering the feelings of workers. Therefore, this study set out to examine if the importance of patient safety could possibly be neglected in a rational culture, because the outcome for patient safety measures may not yield immediate profits or competitive advantages especially during the stage of introducing patient safety measures. At the same time, as rational culture is task-oriented and inclined towards independent action (Cameron & Quinn, 1999), it lacks teamwork and the exchange of knowledge. Based on the arguments above, this study puts forth hypothesis 1: *Rational culture negatively associates with safety management.*

Developmental culture places stress on flexibility and external focus, so it gives greater emphasis to individualism, risk taking, and a high level of workers' aspiration for innovation. Hence, an organization following a developmental model is more willing to blaze new trails, to absorb new information, to make adjustments to the organization at any given time, and to obtain success by learning from past mistakes. At the same time, in terms of management, the organization does not impose strict standards to manage workers, but emphasizes a high level of involvement in innovation and the ability to maintain a leading position in terms of new knowledge, products and services. The developmental culture pursues product originality and unique products and services (Cameron & Quinn, 1999). As the organization with a developmental culture is likely to accept changes, it could easily adapt to a management system of patient safety which might encourage a

comprehensive and accurate service. Hence this study proposes hypothesis 2: *Developmental culture positively associates with safety management.*

The basic assumption of group culture is that management can be carried out through teamwork and staff development, viewing customers as shareholders, developing an environment that is human-centered and empowering workers, so as to encourage their participation and involvement (Cameron & Quinn, 1999). Group culture also places stress on trust, unity and teamwork, with workers sharing responsibilities and the fruits of their labors. It also encourages workers' participation so that they would have a greater sense of belonging. The aim of group culture is to care for workers and achieve a harmonious internal environment. Be it teamwork, worker participation or humanized management, they all support the concepts that patient safety emphasizes. Hence, this study forms hypothesis 3: *Group culture positively associates with safety management.*

The features of a hierarchical culture are those of adhering to regulations and hierarchical levels, as well authority and responsibilities (Cameron & Quinn, 1999). It also emphasizes the operation of hierarchical control and brings about the cohesion of the entire organization by following official laws, regulations, and policies. The value of this culture can be found in its maintenance of efficiency, speed and stability in production, and moreover, the promotion criterion for workers lies with their familiarity with regulations and policies. This study assumes an organization with this culture would be more likely to complement and abide by the country's laws and policies. In addition, the management model of such a culture, which tends toward conformity, coordination, and seeks efficiency and smooth organizational operation, would find it easy to follow through and succeed in safety management. Therefore, this study proposes that a hierarchical culture has a positive impact on safety management and proposes hypothesis 4: *Hierarchical culture positively associates with safety management.*

This study examines safety management from the perspective of organizational culture, the objectives being: (1) to examine the influence of organizational culture on patient safety; (2) to examine which culture is more suited to encourage patient safety.

2. METHOD

2.1 Sample

The distribution and collection of the questionnaires was done at large-scale medical centers, which included three public hospitals and two non-profit proprietary hospitals in northern Taiwan in May, 2005. We first used purposive sampling, starting with workers who have previously taken a Master's degree in management. Then, based on those purposive samples, we asked this first group of workers to select colleagues from their work unit and other related departments to participate in the survey, but not to limit their choice to those with a Master's degree. A total of 163 questionnaires were distributed and 115 were returned. The

response rate was 70.5%. As the first round of sampling did not include doctors, the following method was used to obtain a sample of doctors. Questionnaires were mailed to four hundred doctors who were selected at random from the lists of doctors obtained from the websites of the five sample hospitals. Sixty-six questionnaires were returned, yielding a response rate of 16.5%. The individual is taken as the analytical unit in data analysis.

2.2 Instruments

(1) Organizational culture

The organizational culture questionnaire is adopted from Quinn and Spreitzer's CVA questionnaire, translated it into Chinese and modified it to suit the objectives and audience of this research. Every question uses the Likert-like five-point scale to tabulate the scores. The response options are "Strongly Agree" (5), "Agree" (4), "Neutral" (3), "Disagree" (2) and "Strongly Disagree" (1). Rational culture is defined as the perception of an environment that places stress on production-orientation, work and goal achievement driven motives, competition and sense of achievement (i.e., "the management heads of the hospital are conscientious and meticulous motivators"). Developmental culture is defined as the perception of an environment that places stress on changes, the involvement in innovation and development, growth and acquisition of new resources (i.e., "the management style of the hospital stresses innovation"). Group culture is defined as the perception of an environment that places stress on individualism, loyalty and tradition, and the importance of human resources (i.e., "the atmosphere in the hospital is pleasant"). Hierarchical culture is defined as the perception of an environment that places stress on formality, an integrated structure, formal regulations and policies, efficiency and stability (i.e., "the hospital is quite a formal and structurally integrated organization").

(2) Patient safety management

This section of the questionnaire is self-devised from the literature and expert interview. It covers the four constructs of leadership, teamwork, voluntary incident reporting, and education and training. It explores how respondents perceived reality toward the aspect of patient safety measures in the hospitals they are working in. Leadership is defined as the perception of how the top management performs on various leadership items in terms of showing consideration for workers and the structure of the system (i.e., "we place a strong emphasis on sustained monitoring in looking after patients"). Teamwork is defined as the perception of the state of mutual exchange, cooperation and trust within and between departments (i.e., "mutual exchanges between colleagues are harmonious"). Voluntary incident reporting is defined as the perception of how a harmful event is handled when it takes place in the hospital, the design of the mechanism for making reports to upper levels and post-event analysis management (i.e., "the hospital is able to analyze what caused the reported event"). Education and training is defined as the perception of the education and training on patient safety that the hospital organizes for its workers, and the extent that workers themselves apply the knowledge that

they had learnt (i.e., “I am able to apply what I have learnt on patient safety to my work”).

The patient safety management scale has a total of 19 questions and every question uses the Likert-like five-point scale to tabulate the scores. The response options are “Strongly Agree” (5), “Agree” (4), “Neutral” (3), “Disagree” (2) and “Strongly Disagree” (1).

(3) Demographic variables

This study also collected the respondent’s gender, age, occupational type and supervisory duties as demographic variables.

2.3 Data Analysis

Descriptive statistics are performed to define the basic characteristics among samples. This study uses exploratory factor analysis to determine the underlying constructs of patient safety instrument (Thompson, 2005), and confirmatory factor analysis to determine the construct validity of CVA. The number of factors is determined by eigenvalues and statistical significance tests (Bartlett, 1950). Factor is extracted by principal components analysis. Factor rotation is determined by the varimax method to maximize the differences between the squared pattern coefficients on a factor (Thompson, 2005). Selection of items within each factor is determined by factor loading above 0.6. Subsequent analysis is based on the composite score of each factor which is computed by averaging the scores of the relevant measured variables (Thompson, 2005). Results of correlation and multiple regression are reported as well.

3. RESULTS

3.1 Demographic Statistics

Out of the 181 respondents, 108 were women (59.7%). The average age was 36 years old and the average years of work experience was 9 years. In the distribution of work types among the interviewees the majority, 66, were doctors (36.5%). There were 46 nursing staff (25.4%), 37 medical staff (20.4%) and 32 administrative staff (17.7%). Among the respondents, 36 were in a supervisory position (19.9%).

3.2 Validity and Reliability Reported

This study uses LISREL to perform a confirmatory factor analysis, to test the construct validity of this instrument. The fitness of the final model can be assessed from its absolute fit value, incremental fit value and parsimonious fit value (Huang, 2006). The Chi-square value obtained is 87.07 ($p=0.01$, $p>0.1$ as good), RMSEA (Root mean square error of approximation) is 0.05 (between 0.05 and 0.08 is relatively good), GFI (goodness of fit) in the absolute fit index is 0.93 (anything

greater than 0.9 is good), NFI (normed fit index) in the incremental fit index is 0.97 (anything greater than 0.9 is good), PNFI (parsimony normed fit index) parsimonious fit index is 0.73 (anything greater than 0.5 is good), PGFI (parsimony goodness of fit index) is 0.6 (anything greater than 0.5 is good). Therefore the fitness value of the final model can be deemed satisfactory. Cronbach's Alpha values for the four constructs are as follows: leadership 0.87; teamwork 0.85; voluntary incident reporting 0.77; and education and training on patient safety 0.88 (Table 1).

In order to determine if the framework under the Competing Values Approach is appropriate, the study uses LISREL to perform a confirmatory factor analysis. The Chi-square value in this model is 116.1 ($p=1.0$), RMSEA is 0, GFI is 0.95, NFI is 0.94, PNFI is 0.84, and PGFI is 0.78. Hence, the construct validity of the original CVA has been verified in this study. In addition, under the original CVA scale, the various types of organizational cultures found in the organizational culture framework have Cronbach's Alpha values that, on average, are greater than 0.8. Furthermore, the factor loading exceeds 0.4 in all of the cases. The reliability for each construct is as follows: rational culture 0.82; developmental culture 0.88; group culture 0.92, and hierarchical culture 0.86. All of them are higher than the reliability levels found in Quinn and Spreitzer's study (0.78, 0.81, 0.84, and 0.77 respectively) (Quinn & Spreitzer, 1991). Therefore the construct validity for this questionnaire is very strong.

3.3 Analyses

A correlation matrix (Table 2) was calculated to examine the relationship between organizational culture and patient safety management. Developmental culture ($r=0.54$, $p<0.01$), group culture ($r=0.65$, $p<0.01$) and hierarchical culture ($r=0.58$, $p<0.01$) have significant positive correlations with leadership. At the same time, developmental culture ($r=0.49$, $p<0.01$), group culture ($r=0.66$, $p<0.01$) and hierarchical culture ($r=0.56$, $p<0.01$) have significant positive correlations with teamwork. Developmental culture ($r=0.45$, $p<0.01$), group culture ($r=0.57$, $p<0.01$) and hierarchical culture ($r=0.54$, $p<0.01$) have significant positive correlations with voluntary incident reporting. Developmental culture ($r=0.43$, $p<0.01$), group culture ($r=0.51$, $p<0.01$) and hierarchical culture ($r=0.47$, $p<0.01$) display significant positive correlations with education and training. Rational culture has a negative correlation with leadership, teamwork, voluntary incident reporting and education and training, but the correlations are non-significant.

Table 3 shows the tabulated regression results. Investigating the influence that each type of organizational culture has on patient safety management, rational culture has a negative and significant correlation with leadership ($\beta = -0.29$, $p<0.01$), teamwork ($\beta = -0.18$, $p<0.01$), and voluntary incident reporting ($\beta = -0.2$, $p<0.01$). Hypothesis 1 is thus supported. Developmental culture has a positive and significant correlation with leadership ($\beta = 0.32$, $p<0.01$), voluntary incident reporting ($\beta = 0.18$, $p<0.01$) and education and training ($\beta = 0.21$, $p<0.01$). Developmental culture also displays a small positive correlation with teamwork ($\beta =$

0.14). Hypothesis 2 is thus supported. Group culture has a positive and significant correlation with leadership ($\beta= 0.29$, $p<0.01$), teamwork ($\beta= 0.44$, $p<0.01$), voluntary incident reporting ($\beta= 0.22$, $p<0.01$), and education and training ($\beta= 0.28$, $p<0.01$). Hypothesis 3 is thus supported. Hierarchical culture only has a significant positive correlation with leadership ($\beta= 0.20$, $p<0.01$) and voluntary incident reporting ($\beta= 0.23$, $p<0.01$). There is a small, but non-significant positive correlation with teamwork and education training. Hypothesis 4 is thus supported.

Table 1. Result of factor analysis on patient safety management

Patient Safety	Construct Factor Loading	alpha
Leadership (I felt that the leader of your hospital ...)		
Caring about how we feel and what we need at work.	0.76	0.87
Providing opportunities to express views.	0.79	
Advocacy of cross-departmental teamwork.	0.67	
Setting a good example by participating to patient safety	0.74	
Placing a strong emphasis on sustained monitoring in looking after patients.	-	
Teamwork (I felt the hospital is...)		
Open communication channels	0.70	0.85
Listen and respond to employees.	0.74	
I can trust my colleagues in my work.	0.82	
Cross-departmental standard assignment process.	-	
Cross-departmental improvements.	-	
Harmony among colleagues.	-	
Voluntary incident reporting mechanism (I felt that the hospital would...)		
Analyze what caused the reported event.	0.62	0.77
Report process is simple and convenient	0.67	
Clearly defining the responsibility about error	0.63	
Respond and change according to the analysis of error.	-	
Make employees feel embarrassed.	-	
Education and training (I felt that the hospital would...)		
Introduce the concept of patient safety.	0.85	0.88
Regularly conducts education and training related to patient safety.	0.83	
Make employees learn from other errors	0.81	

Table 2. Means, Standard Deviations, and Correlation

Variable Name	Mean (s.d.)	1	2	3	4	5	6	7	8
Age	36(9.6)	-							
Rational Culture	3.1(0.6)	-0.08	--						
Developmental Culture	3.3(0.7)	0.001	0.43**	-					
Group Culture	3.4(0.7)	0.05	0.06	0.69**	-				
Hierarchical Culture	3.5(0.6)	-0.04	0.23**	0.69**	0.78**	-			
Leadership	3.6(0.8)	0.03	-0.09	0.54**	0.65**	0.58**	-		
Teamwork	3.6(0.7)	-0.02	-0.07	0.49**	0.66**	0.56**	0.68**	-	
Voluntary incident reporting	3.4(0.7)	0.13	-0.07	0.45**	0.57**	0.54**	0.57**	0.62**	-
Education and Training	3.8(0.7)	-0.04	-0.02	0.43**	0.51**	0.47**	0.51**	0.43**	0.51**

Note. * $p < 0.05$; ** $p < 0.01$.

Table 3. Result of patient safety management regression analysis

Variables	Leadership	Teamwork	Incident Reporting	Education & Training
Occupation - Doctor	-0.06	0.18*	-0.09	0.02
Occupation - Nursing Officer	-0.06	0.08	-0.13	0.15
Occupation - Medical Officer (Reference group: Administrative Officer)	-0.01	0.20**	-0.16	-0.12
Supervisor (Reference group: Non-supervisor)	0.05	-0.05	0.06	0.05
Gender (Reference group: Female)	0.06	-0.09	-0.08	-0.01
Rational Culture	-0.29**	-0.18**	-0.20**	-0.12
Developmental Culture	0.32**	0.14	0.18*	0.21*
Group Culture	0.29**	0.44**	0.22*	0.28*
Hierarchical Culture	0.20*	0.09	0.23*	0.13
R ²	0.53	0.50	0.39	0.36
Adjusted R ²	0.49	0.46	0.34	0.31
F statistics	14.43**	12.84**	8.15**	7.14**

Note. * p < 0.05; ** p < 0.01. Regression coefficients are indicated in standardized regression coefficients.

4. DISCUSSION

4.1 Organizational Culture and Patient Safety Management

Overall, group culture has a strong influence on safety management, rational culture has a negative impact on safety management, and developmental culture and hierarchical culture have an influence on some aspects of safety management. Therefore, group culture can indeed help to drive the implementation of the patient safety system. The building and promotion of a group culture can be carried out from several aspects, such as adopting a participatory management. Methods such as delegating authority, team building, strengthening worker participation and developing human resources, as well as having open communications can be adopted (Cameron & Quinn, 1999).

As Quinn and Spreitzer used the Likert-like five-point scale for score tabulation in the CVA questionnaire, it assumes that the organization should not exist as a single cultural entity but should have multi-cultures (Quinn & Spreitzer, 1991; Kwan & Walker, 2004). This assumption was supported by Kwan and Walker's study on the organizational culture of four universities in Hong Kong (Kwan & Walker, 2004). This study presents the same results, finding that organizational culture is formed from these four cultural types, each with its strengths and weaknesses but co-existing at the same time.

This study suggests that group culture is the most significant predictor of safety management, while rational culture negatively predicts safety management. Could this conclusion violate the principles of management if we followed the result and failed to perform the effectiveness and productivity stressed under rational culture? Or could we accept the perceived success of the implementation of safety management without relying on pursuing effectiveness? This might explain

why those hospitals have recently introduced safety management.

Persuading employees to report errors might need encouragement during the early stages. Too much focus on incident analysis and responsibility taking (which rational culture would address) might lead to less reporting and participation. Group culture, which focuses on maintaining good mentor relationships, might drive employees to fulfill the requirement of patient safety.

When safety systems have been established, the balances between the different types of culture might be addressed in order to improve teamwork, regulation, development and productivity.

Therefore, further in-depth exploration in this issue is recommended.

4.2 Research Instruments

As the safety management questionnaire is self-devised, its validity and reliability are especially important. Some items were removed based on the results of factor analysis. This was due to an absence of the practice (such as the item “cross departmental improvements and design processes”) and inconsistent responses among the correlated questions. The result of confirmatory factor analysis indicates the good construct validity of this instrument.

The items in the CVA questionnaire were all retained and the construct validity found to be good. Although questions with weaker loadings were removed in Kwan and Walker’s study (Kwan & Walker, 2004), the research data in this study had good construct validity in explaining the concept of CVA culture. This result mirrors the construct validity of the same questionnaire that Kalliath found by using the structural equation method (Kalliath, Bluedorn & Gillespie, 1999).

4.3 Research Limitations

(1) Generalization

As the research took place at a time when each hospital was busy with its accreditation process, there was a lower interest in taking part in the research. Therefore, this study could only adopt purposive sampling and follow snowball sampling as the sampling methodology for non-doctors. The response rate of doctors was also not high and there is thus a limit to the extent to which the results can be generalized to the larger population. In addition there could be the problem of sampling error. This study is not able to prove if the understanding is the same for workers interviewed, workers who refused to be interviewed, and others workers who were not surveyed in the study.

(2) Common method variance

This study could suffer from the problem of common method variance, as the questionnaire is a self-administered instrument and the data source is a single individual. To avoid this problem, a few techniques were used during the initial design stages of the questionnaire to reduce possible errors. For instance, this was an anonymous survey and the meanings of questions were not disclosed, items were positively and negatively worded, and comprehensive questions were

itemized. Furthermore, an unrotated factor analysis was performed after the collection of data to determine common method variance (Peng, Kao & Lin, 2006), yielding very good results. No single factor or general first factor was found. Therefore, the problem of common method variance in this study has been lessened.

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