

Organizational Culture for Patient Safety in Japanese Hospitals

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Abstract. The present paper reviews the results of two questionnaire-based surveys of safety culture, risk management systems and their related issues in Japanese hospitals. One questionnaire was aimed at identifying current states in risk management and incident reporting systems in Japanese hospitals, and 346 responses were obtained from heads of the nursing department of all hospitals having more than 400 beds in Japan. In the other survey, a questionnaire was developed by adapting from Helmreich's "Operating Team Resource Management Survey". Using 600 responses collected from doctors, nurses and pharmacists in five hospitals in Japan, we investigated healthcare staff's attitudes and perceptions to their job, management systems, and other safety related issues. In addition, we compared actual rates of incident reporting collected from a hospital surveyed and safety culture aspects derived from questionnaire responses.

Based on the integrated results of questionnaire-based surveys and analysis of incident statistics, we discuss several current issues of safety culture and risk management in Japanese hospitals.

Keywords. Safety Culture, Patient Safety, Incident Reporting, Risk Management, Questionnaire-based Survey.

1. Introduction

It is widely recognised that human error is the predominant cause of accidents not only in human-machine system operations but also in health care (Kohn et al., 1999). In recent decades, organizational factors have been recognised to be of great importance for safe operations (Reason, 1993). Thus, it has been observed that organizational problems are frequently latent causal factors that contribute to the occurrence of human errors made by frontline personnel; and similarly, it has been pointed out that the dominant type of contributing causes of major accidents involve the organizations that themselves shape the *safety culture* within which the employees operate (Reason, 1997).

There are many proposed definitions of safety culture. One of the more succinct definitions was presented in a report by ACSNI (1993) stating that "it is the product of

individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to and the style and proficiency of an organization's health and safety management". Following this definition, safety culture is coupled not only to management's commitment to safety, its communication style and the overt rules for reporting errors but also to employees' motivation, morale, perception of errors and attitudes towards management and factors that impact on safety, (e.g., fatigue, risk taking and violations of procedures – cf. Andersen, 2002).

To study the relationship between safety culture and operational safety, a number of projects have been conducted to uncover individual organization's safety culture in high-tech industries such as aviation, maritime, railway and process control industries (e.g., Helmreich and Merrit, 1998; Itoh et al., 2003b). It could be expected that medical activities share many characteristics of these high-tech human-machine system operations, and that patient safety will similarly be affected by safety culture. Therefore, it would seem useful to adapt some of the research methods and survey techniques (Itoh et al., 2003b) that have been developed for application in the high-tech human-machine system domains to investigating human factors aspects of patient safety.

In the present paper, we mention current issues on safety culture in Japanese hospitals based on the results from two questionnaire-based surveys with combination to analysis of incident reporting statistics. We first overview the present states in hospital risk management and incident report systems in Japan. Then, we describe characteristics of safety culture in Japanese hospitals. Finally, we discuss factors jeopardising patient safety based on comparison results between several elements of safety culture and the incident-reporting rates obtained independently from one of the hospitals surveyed.

2. Risk Management Survey

2.1 Risk Management Questionnaire and Responses

The risk management questionnaire comprised four parts, i.e., questions about (1) forms of accident/incident reporting, (2) application purposes of an incident reporting system, (3) operations of risk management, and (4) items to be reported in an incident report as well as hospital attributes such as ownership type of hospital, the number of beds, utilisation of beds, and the numbers of doctors, nurses and pharmacists.

The questionnaire was distributed to heads of the nursing department in all Japanese hospitals having more than 400 beds. The survey was made in December of 2002, and 346 hospitals responded to the questionnaire (response rate of 47.3%).

2.2 Risk Management in Japanese hospitals

As an overall trend of questionnaire responses, only a few differences were observed in a structure of healthcare risk management between classes of each hospital attribute. There were significant differences in only two items between hospital ownership types, e.g., governmental, municipal, and medical foundational hospitals: the number of risk management committee members ($\chi^2 = 40.59$, $p < 0.01$), and compensation procedure for

adverse events ($\chi^2 = 70.13$, $p < 0.01$). No difference was identified in any risk management item between hospital classes of the number of beds. These results indicate that Japanese hospitals have quite homogeneous structure for risk management.

Every hospital organizes a risk management committee that typically composes of a risk manager, a head official, heads of all departments and clinical specialties. In a quarter of hospitals responded to the questionnaire, a hospital chief participates in risk management meetings as a formal member of the committee. However, very few hospitals (less than 2%) invite risk management or human factors experts outside of their organization. A regular meeting of the risk management committee is held once or twice a month in most hospitals (more than 90%), and the member's participation rate is very high: more than 90% of members attend the meeting in half of hospitals, and more than 80% of members do in 80% of hospitals. This may indicate that healthcare staff's concern with patient safety is reasonably high.

Figure 1 depicts response data on the risk management committee's roles collected from all 346 hospitals. As can be seen in this figure, the committee is obliged to perform diversified functions for patient safety. Heads of the nursing department in more than 80% of hospitals regard the following activities as the risk management committee's roles: planning counter-measures for accident prevention, planning training programmes, and distribution of accident/incident information within a hospital. In addition, a large number of hospitals list other functions as the committee's responsibilities: generation of accident/incident statistics (75%), analysis of accident/incident cases submitted to the reporting system (64%), and implementation of counter-measures for accident prevention (62%).

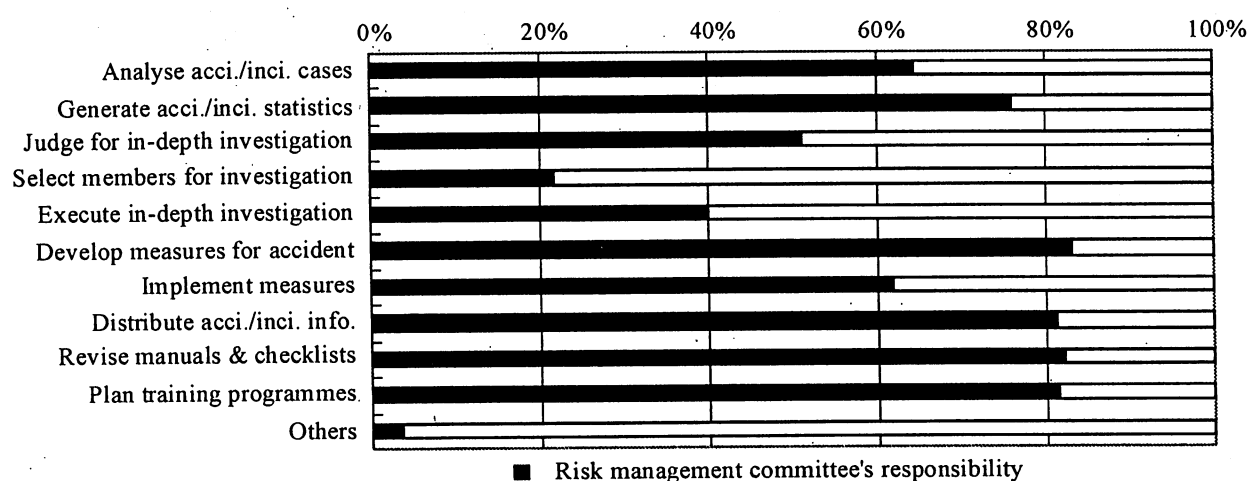


Figure 1. Roles of risk management committee in Japanese hospitals.

Closely connecting to the risk management committee, only 30% of hospitals have a "full-time" risk manager, and in 52% of hospitals, a member of the risk management committee, typically one of the deputy hospital chiefs, serves additionally as a risk manager. Approximately 20% of hospitals have no formal post of risk manager. Also, only a few hospitals organize a special section or division of risk management. Considering balance between requirements and work forces for risk management activities, it seems to be critically required to make appropriate staffing as well as an expert section for risk management in Japanese hospitals.

An incident reporting system has been highlighted as a primary means of hospital risk management in Japan. Thus, the nursing department heads' responses to the item on

application purposes of the reporting system are shown in Figure 2. Similar to the roles of risk management committee, the incident reporting is recognised to have applied to various purposes. In more than 90% of medium and large scale hospitals – having more than 400 beds – in Japan, it is stated that reported incident cases are applied to generation of accident/incident statistics and analysis of individual incident cases. The reporting system is also operated with other common application purposes. More than 50% of hospitals list the following functions: development of training programmes, sharing analysis results of an individual case as well as information on the case, and documentation of the analysis results. However, from our interviews with risk managers and hospital senior managers which have been independently conducted, many of them have pointed out several problems with the incident reporting system: Incident reports are just gathered to the risk manager, and he or she (with his/her subordinates) only generates incident statistics with no further applications. If it is true in many hospitals, the above-mentioned purposes responded from heads of the nursing department may be reasonable to interpret as potential applications available or their desires to the incident reporting system, not as the actual well-managed activities.

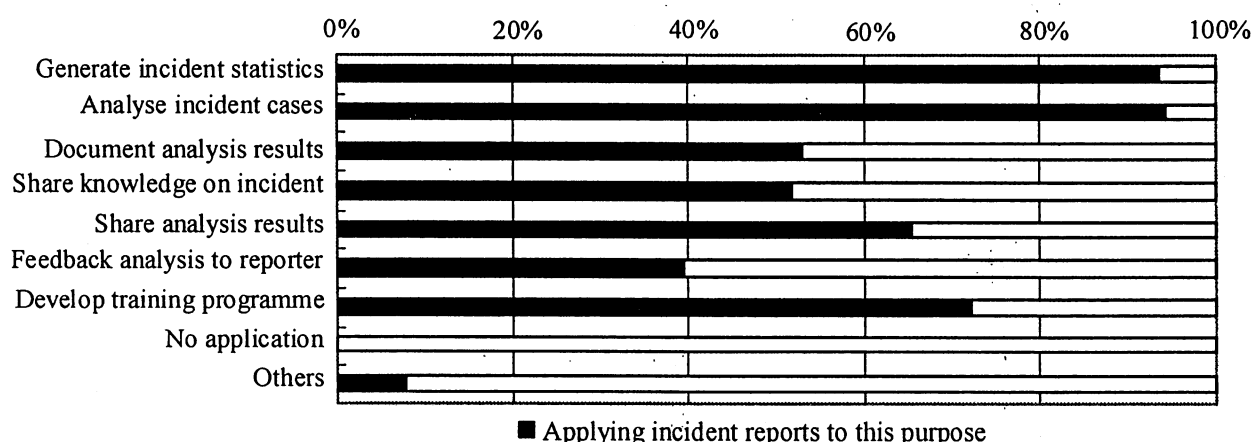


Figure 2. Application purposes of incident reporting system in Japanese hospitals.

3. Safety Culture Survey

3.1 Safety Culture Questionnaire and Responses

The questionnaire comprises five parts, and has an additional demographic section where respondents fill in their department or ward specialty, position, experience and age group. The present paper reviews results from only the first part of the questionnaire. Detailed results for this part and those for the other parts are referred to our previous studies (Itoh et al., 2002; 2003a). Including Part 1, four of the five parts of the questionnaire was adapted from Helmreich's "Operating Team Resource Management Survey" (Helmreich and Merritt, 1998). We have transformed terms and statements from Helmreich's original questionnaire to fit the working situation of doctors, nurses and pharmacists working not only in the operating room but also in other types of specialties and wards, keeping the same meaning and intention for each question.

Part 1 contains 57 questions about perceptions of hospital management as well as general questions (e.g., training) that may have a correlation with safety performance. Respondents are asked to rate each question on a five-point Likert scale between 1 and 5 (from 'strongly disagree' to 'strongly agree'). These question items can be largely classified into several groups in terms of organizational and human aspects that form safety culture. In this study, with reference to the original classification by Helmreich and Merritt (1998), we arranged all the items into nine categories of distinct "safety culture aspects": (1) power distance, (2) communication, (3) teamwork, (4) recognition of own performance under high stress, (5) stress management for team members, (6) morale and motivation, (7) satisfaction with management, (8) recognition of human error, and (9) awareness of own competence.

Each category includes several items. For example, the category, power distance comprises twelve items among which the following examples illustrate the format and style of the questions: "The senior person should take over and make all the decisions in life-threatening emergencies"; "Senior staff deserve extra benefits and privileges"; and "Doctors who encourage suggestions from team members are weak leaders."

The questionnaire was distributed to doctors, nurses and pharmacists working in five hospitals located in different areas in Japan. A total of 66, and 486 and 43 responses were obtained from doctors, nurses and pharmacists, respectively. The mean response rate was 90.7% across the three groups.

3.2 Professional Culture of Healthcare Staff

Percentage agreement and disagreement for each of the safety culture aspects are shown in Table 1 across the three professional groups. The percentage [dis]agreement is defined as the following rate: the nominator represents 5 and 4 responses, i.e., "strongly agree" and "slightly agree" [the 1 and 2 responses, i.e., "strongly disagree" and "slightly disagree"]; and the denominator represents the total number of responses for the specific items of each aspect. Before calculation of these indices, items that represent negative meaning in terms of the aspect have their ratings of agreement reversed, i.e., 5 and 4 responses, reversed to 1 and 2, and vice versa. This table includes significance levels (chi-square value) of differences between the professional groups.

The main general results show that hospital staff has a relatively high morale and motivation, they exhibit good awareness of communication among teams, members and their organization. Their satisfaction with teamwork is also relatively high; and in particular, nurses' perception of the value of teamwork is the highest, two thirds of nurses having a positive attitude to this aspect. Compared to these three aspects, percentage agreement in terms of satisfaction with management is not high, and doctors' satisfaction is significantly the lowest of the three professional groups in health care.

One of the safety culture aspects focused on in this study is power distance: this refers to as the psychological distance between leaders or superiors and subordinate members: A smaller distance reflects, for example, that leaders and their subordinates have open communication initiated not only from leaders but also, more critically, from juniors. The results shown in Table 1 indicate that a relatively small power distance seems to exist in Japanese hospitals; in addition, there is no significant difference in perception of this aspect between doctors, nurses and pharmacists.

A large part of healthcare staff has realistic attitudes to and a realistic recognition of human error. That is, all three professional groups recognise that "human error is inevitable," and they do not agree with the question "errors are a sign of incompetence". In contrast to these items, however, there was a large difference in responses to the error-related item "I am encouraged by my leaders and co-workers to report any incidents that I may observe" between the three professional groups. More than 85% of nurses agreed with this question while the percentage agreement of doctors was less than 45%.

Table 1. Percentage agreements and disagreements for safety culture aspects.

Safety culture aspects	Doctors	Nurses	Pharma.	Total	χ^2
I. Power % agree.: distance %disagree.:	30.4% 59.7%	21.8% 60.4%	27.6% 59.2%	23.2% 60.3%	0.88
II. Communication	88.1% 4.9%	85.9% 3.8%	89.4% 2.9%	86.4% 3.9%	14.75**
III. Team work	57.6% 26.0%	65.0% 15.7%	55.2% 24.8%	63.5% 17.5%	16.17**
IV. Own performance under high stress	49.2% 38.1%	41.0% 35.7%	42.6% 32.9%	42.0% 35.8%	3.92
V. Stress management for team member	69.5% 19.8%	69.4% 15.8%	66.8% 21.6%	69.2% 16.6%	5.12
VI. Morale & motivation	72.9% 16.0%	65.7% 15.1%	65.9% 18.5%	66.5% 15.4%	14.75**
VII. Satisfaction with management	45.5% 39.6%	51.3% 28.8%	51.7% 31.7%	50.7% 30.1%	10.40**
VIII. Recognition of human error	60.6% 26.3%	60.7% 21.3%	55.4% 28.6%	60.3% 22.4%	2.32
IX. Awareness of own competence	58.2% 27.1%	44.8% 24.8%	40.2% 30.9%	46.0% 25.5%	17.52**

** $p < 0.01$, * $p < 0.05$

Regarding attitudes to stress, most hospital staff recognises the need for monitoring colleagues' levels of stress and workload. For example, more than 90% of respondents agreed that team members should be monitored for signs of stress and fatigue during task. In contrast, respondents do exhibit any great awareness of the effects of stress on their own performance. More than half of doctors, and one third of the nurses disagreed with the item "I am more likely to make errors or mistakes in tense or hostile situations". Similarly, only 5% of doctors agreed that their performance is reduced in a stressed or fatigued situation (89% disagreement; and a bit lower at 78% for nurse).

4. Comparisons of Incident Rates with Safety Culture

4.1 Incident Statistics

A statistical summary of incident reports submitted from nurses only was obtained from one of the hospitals surveyed in this study. The summary includes the number of incidents reported during the previous year of the questionnaire survey (April 2000 – March 2001) based on incident types as well as wards and positions of nurses. In only a single case, a patient did suffer an injury, namely a fracture of the clavicle after falling down from a bed with free railing – a nurse had forgotten to put up the railing. We calculated two indices on ward- and position-based reporting rates: (1) reporting rate to the system, i.e., the rate of incidents of the given type submitted to the hospital's reporting system per nurse in a year, and (2) the rate of informing the patient, i.e., calculated by dividing the number of acts of informing the patient about the event by the total number of reported cases.

Although details of analysis results are not included in the present paper (cf. Itoh et al., 2002), the reporting rate to the system varies across the wards. The reporting rate from the operating room was the highest of all the wards in this hospital. Nurses working for the outpatient and in the surgery ward submitted incident reports less frequently than those in the other wards. This may suggest that the likelihood of incident occurrence basically depends on the type of medical treatments and nurses' activities.

4.2 Correlation between Questionnaire Responses and Reporting Rates

Using questionnaire responses only from nurses in this hospital, we examined correlations between the response to error reporting and the actual rates of reporting to the system and of informing to the patient. Only brief description of the correlation analysis is presented here (cf. Itoh et al., 2002). As a result, there was no correlation between the response to the item "reporting the event to the local reporting system" and the actual reporting rate to the system. In an interview with a risk manager of this hospital, she stressed on hospital-wide initiatives for patient safety taken since five years ago, and the incident reporting system has been intensively managed particularly in the nursing department in terms of wide range of activities from efficient report submission to development of counter-measures. The risk manager continued to mention that a criterion on submitting a report, i.e., what event should be reported, is currently identical across all the wards. If these statements are true, one may speculate that the actual rate of reporting to the system serves to measure accident risk in *this* hospital.

To discuss effects of safety culture on the actual reporting behaviour, a correlation of the reporting rate to the system with one of the safety culture aspects, *recognition of human error* is depicted in Figure 3 (a) based on the ward and the position of nurses. As can be seen in this figure, the actual rate of incident reporting is negatively correlated with the recognition level of human error ($r = -0.944$; $p < 0.01$). This indicates that the more realistic recognition towards human errors becomes, the less frequently an incident report is brought up. According to the interpretation about this index remarked above, it

may be suggested that realistic recognition of human error contributes to a lower risk of adverse events in a hospital.

Figure 3 (b) shows a correlation between the informing rate to the patient and recognition of human error. This figure implies that this safety culture aspect is also correlated with the nurse's willingness to explain an event to the patient ($r=0.983$, $p<0.01$). It is natural to interpret this result as indicating that a realistic recognition of human errors facilitates the nurse's willingness to inform the patient about the event.

Another safety culture aspect, *power distance*, was examined to ascertain whether it influences the rate of reporting and the rate of informing the patient. For this purpose, relationships of this aspect to these reporting indices are depicted in Figure 4. Figure 4 (a) indicates that this safety culture aspect seems to have a slightly negative, but not significant correlation with the reporting rate to the system ($r=-0.568$, $p>0.05$). There is a single exceptional data point (an outlier) that deviates from the other four ward groups. This plot comes from the nurse group of the operating room. Excluding this group from the geometric plane, the graph plot indicates that there may be a positive correlation between the reporting rate and the power distance. Thus, it may be suggested that a small power distance (i.e., open communication between team members and leaders and a small psychological distance between leaders and subordinates) contributes to good organizational culture and in turn to patient safety. At the same time, these results may suggest that the actual reporting rate is affected not only by the professional activities, e.g., operating room vs. others, but also by the power distance in the workplace although it is impossible to derive a sound conclusion only from these results.

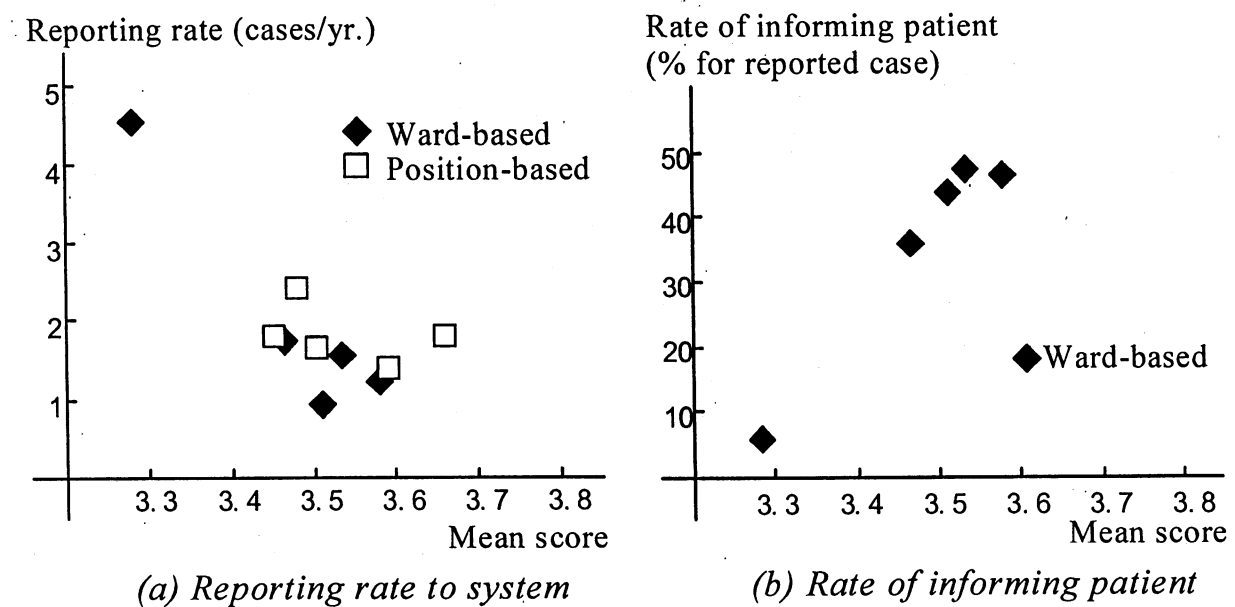


Figure 3. Correlation of recognition of human error with reporting rate to system (a) and with rate of informing patient (b).

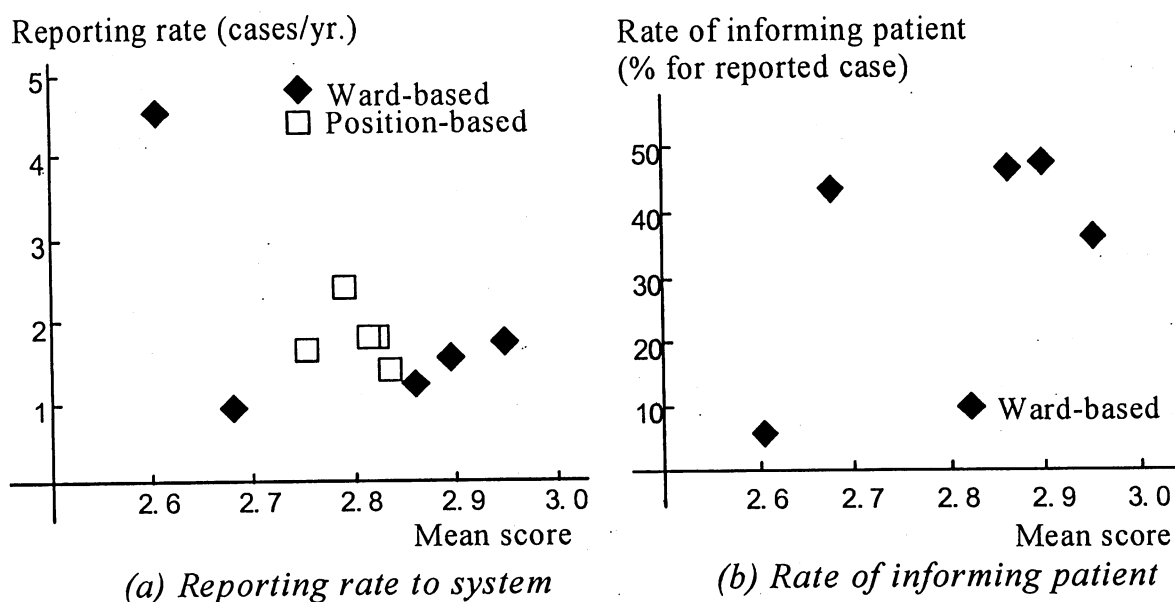


Figure 4. Correlation of power distance with reporting rate to system (a) and with rate of informing patient (b).

On the other hand, the actual rate of informing the patient seems to be positively correlated with the level of power distance ($r=0.647$, $p>0.05$), as shown in Figure 4 (b). The graph plot excluding the data point of the operating room group – it may look an outlier in this geometric plane – seems to indicate a slightly positive or no correlation between the informing rate to the patient and the power distance. From this result, it is not possible to judge whether small power distance facilitates healthcare staff to inform the patient about an adverse event happened. However, it may be true that there are several organizational factors confounded with the type of ward in this type of data, and therefore it is reasonable to consider that such unknown organizational factors contribute to the informing rate to the patient.

5. Conclusion

This paper reported organizational issues, particularly safety culture in Japanese hospitals based on the results from two questionnaire-based surveys and analysis of the actual rates of incident reporting. From the hospital risk management survey, it is found that Japanese hospitals perform risk management with quite homogeneous structure in terms of responsibilities of risk management committee, organization of committee members, frequency of its regular meeting, etc. However, substance of the risk management such as administration styles, detailed contents of activities and activity levels varies greatly across hospitals.

A major outcome of the safety culture survey was to obtain a hypothesis concerning correlations between the actual reporting rate and some of the safety culture aspects, especially recognition of human fallibility, and power distance, for future investigations. In particular, the survey results seem to indicate that a nurse group who has a relatively larger power distance and unrealistic recognition of human errors will be liable to pro-

duce a greater number of incidents. In addition to a realistic recognition of human error potentials and small power distance, we further need to examine relations of other safety culture aspects such as morale and motivation – that have been found to be key factors for railway safety (Itoh and Andersen, 1999; Itoh et al., 2000) – with error reporting or safety performance measures in the healthcare system.

When we obtain sound results of statistical correlations between the above-mentioned safety-related measures such as the actual incident rates and some of safety culture factors, the questionnaire-based method may be a useful supplement to accident/incident data in order to identify high and low risk work units in the medical domain. This is of importance whenever incident reporting is incomplete or when reporting criteria are heterogeneous. Equally, while incident reporting is a retrospective index of safety levels, the survey data may be used prospectively.

6. Acknowledgements

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