Healthcare Staff Attitudes towards Management, Job, Teamwork and Leadership in Japanese Hospitals

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ABSTRACT

The present paper reports the results of a questionnaire-based survey of safety culture in hospitals including healthcare staff's attitudes towards and perceptions of hospital management, work goals, leadership and teamwork. Approximately 600 responses were collected from physicians, nurses and pharmacists working in five Japanese hospitals. The questionnaire was adapted from Helmreich's "Operating Team Resource Management Survey" and contained, in addition, questions about respondents' reporting of their own errors and information to patients who have suffered adverse events. This paper describes results of the survey that relate to healthcare staff attitudes towards safety-related issues including comparisons between departments and wards as well as work positions. In addition, we compare the attitudes of healthcare staff with those of ship officers that have been elicited using a similar type of questionnaire. Based on the survey results, we discuss professional culture of Japanese healthcare systems that are closely relating to patient safety.

Keywords

Safety culture, Patient safety, Medical staff attitudes, Adverse events, and Questionnaire-based survey

1. INTRODUCTION

It is widely recognised that human error is the predominant cause of accidents not only in human-machine systems involved in, mainly high-tech, transport and industrial domains such as aviation, railway, ship handling and nuclear power production but also in healthcare systems and in particular in hospitals [12]. In recent years, there has been a much-heightened focus on the impact of organisational factors on safety [13]. Similarly, it has been pointed out that the dominant type of contributing causes of major accidents involve the organisations that themselves shape the safety culture or climate within which their employees operate [5, 14]. The concept of safety culture has been defined in various ways by researchers. A frequently cited definition was provided by the UK Advisory Committee on the Safety of Nuclear Installations which defined safety culture as "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 organisation's health and safety management" [1]. In other words, the concept 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, attitude to management and their perception of errors and performance shaping factors [2].

At the same time, in recent years a number of projects have sought to uncover the safety culture of individual organisation in the above types of high-tech industries. In these projects, for example, operators' safety culture related attitudes have been found to correlate with incident/accident rates in railway operations and to be important indices of safety performance [9, 10, 11]. In the healthcare domain, a recent study found that a number of aspects relating to safety culture – such as acknowledgement of human error and power distance – were correlated with the rate of incident reporting of individual work units [8], and it was suggested that they might in turn impact on patient safety.

In the present study, we performed a questionnaire-based survey to identify characteristics of safety culture in Japanese hospitals. In our former article [8], we described findings about healthcare staff attitudes towards incident and error reporting including their actions vis-à-vis the individual patient who has been injured by medical error. The findings were based on the analysis of responses to questions relating to two fictitious adverse events that are a part of the questionnaire applied in the present study. In this paper, however, detailed results of other parts in the survey are reported, particularly focusing on healthcare staff perceptions of and attitudes towards hospital management, job, leadership and teamwork. As part of the safety cultural structure in healthcare systems, we identify differences and similarities in staff attitudes between departments/wards, positions and organisations as well as between physicians, nurses and pharmacists. In addition, the questionnaire responses from physicians and nurses are compared with those of ship officers that have been collected in our previous studies using a similar type of questionnaire [3, 9]. Based on the integrated results of the questionnaire survey, we discuss some current issues of safety culture in Japanese hospitals as well as factors that jeopardise patient safety.

2. QUESTIONNAIRE

The questionnaire applied in this study comprises five parts and has an additional demographic section where respondents fill in their department or ward specialty, position, experience and age group. Four of the five parts of the questionnaire have been adapted from Helmreich's "Operating Team Resource Management Survey" [6]. The Helmreich questionnaire has several derivatives focusing on specific domains and allows us to compare the results with ones derived from other domains, e.g., maritime operations and aviation [3, 6, 9]. One of the greatest advantages of using the adapted questionnaire is the opportunity it provides for comparing professional culture across domains. We have transformed terms and statements from the original "Operating Team Resource Management Questionnaire" to fit the working situation of physicians, nurses and pharmacists working not only in the operating room but also in other types of departments and wards, keeping the same

meaning and intention for each question. Finally, the questionnaire has been translated into Japanese.

Part I of the questionnaire contains 57 question items about perceptions of hospital management as well as general questions about factors or attitudes that may impact on safety performance. Respondents are asked to rate each item on a five-point Likert scale between 1 and 5 (from 'strongly disagree' to 'strongly agree'). The question items can be classified into distinct groups in terms of organisational and human aspects that form hospital safety culture. In the present study, with reference to the original classification by Helmreich and Merritt [6], 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 degradation under high stress or workload, (5) stress management for team members, (6) morale and motivation, (7) satisfaction with management, (8) recognition of human error potential, 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 "physicians who encourage suggestions from team members are weak leaders."

The second part of the questionnaire was developed for Danish survey of physicians' and nurses' attitudes [4], in which respondents are asked about their behaviour and actions in terms of reporting or talking with their leaders and colleagues their own errors as well as their information to patients who have become victims of such errors. Respondents' reactions are elicited as responses to two fictitious adverse events. The respondent is asked to study each case vignette and subsequently to rate his or her likelihood of engaging in various actions described in the questionnaire on a five point Likert scale.

Part III asks respondents about their perception and preference of leadership styles, offering descriptions of four different styles of leadership varying from an autocratic to a democratic type. For example, a sample description of the most autocratic style is: "A leader usually makes decisions promptly and communicates them to subordinates clearly and firmly. He or she expects them to carry out the decisions loyally without raising difficulties". Respondents are then asked two questions: (1) which style you most prefer to work under, and (2) which style you find yourself actually working under most often in your organisation.

In Part IV, 15 questions about work goals are included involving issues such as security of employment, changing work routines with new, unfamiliar tasks, and working with people who cooperate well with one another. Like the other parts of the questionnaire, respondents are asked to rate each item on a five-point Likert scale (from 'of very little or no importance' to 'of utmost importance'), considering his/her ideal job. In the last part, respondents describe their personal perception of the quality of teamwork and cooperation with different professional members – working in several specific departments such as internal medicine, surgery and anaesthesiology – at various positions.

The questionnaire was distributed to physicians, nurses and pharmacists working in five hospitals located in different areas in Japan. The survey was made between December of 2001 and January of 2002. A total of 66, 486 and 43 responses were obtained from physicians, nurses and pharmacists, respectively. The mean response rate was 91% across the three professional groups. Among physicians, 33 respondents were heads of department, 22 consultants or physicians after residents, and 9 residents. In the nurse group, responses were collected from 32 matrons and 97 deputy leaders while 354 were from ordinary nurses. In the pharmacist group, samples came from two leaders, 11 deputy leaders and 30 from ordinary staff.

3. STAFF ATTITUDES IN HOSPITAL

3.1 Hospital Safety Culture

Using the questionnaire responses to Part I, percentage agreement and disagreement for each safety culture aspect mentioned in the last section 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 had their figure reversed, i.e., 5 and 4 responses were reversed to 1 and 2, and vice versa. Finally, tests of significance (Kruskal-Wallis) were performed for each safety culture aspect as well as for each question item to identify significant differences between the professional groups.

Table 1 Percentage (dis)agreement of safety culture aspects

Safety culture aspects		Physician	Nurse	Pharma.	Total	X_0^2
I. Power distance	% agree.:	30.4%	21.8%	27.6%	23.2%	0.88
	%disagree.:	59.7%	60.4%	59.2%	60.3%	
II. Communication		88.1%	85.9%	89.4%	86.4%	14.75**
		4.9%	3.8%	2.9%	3.9%	
III. Teamwork		57.6%	65.0%	55.2%	63.5%	16.17**
		26.0%	15.7%	24.8%	17.5%	
IV. Own performance under high stress		49.2%	41.0%	42.6%	42.0%	3.92
		38.1%	35.7%	32.9%	35.8%	
V. Stress management for team member		69.5%	69.4%	66.8%	69.2%	5.12
		19.8%	15.8%	21.6%	16.6%	
VI. Morale & motivation		72.9%	65.7%	65.9%	66.5%	14.75**
		16.0%	15.1%	18.5%	15.4%	
VII. Satisfaction with management		45.5%	51.3%	51.7%	50.7%	10.40**
		39.6%	28.8%	31.7%	30.1%	
VIII. Recognition of human error		60.6%	60.7%	55.4%	60.3%	2.32
		26.3%	21.3%	28.6%	22.4%	
IX. Awareness of own competence		58.2%	44.8%	40.2%	46.0%	17.52**
		27.1%	24.8%	30.9%	25.5%	

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

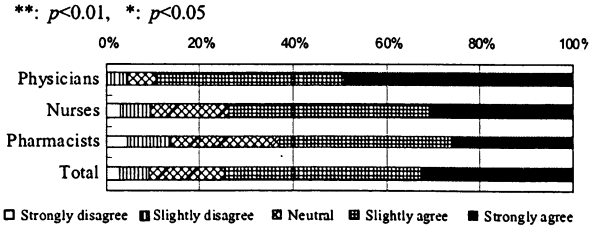

Figure 1 Responses of the item "I like my job"

The overall trend of results from the five hospitals surveyed in this study is that the healthcare staff indicates a relatively high morale and motivation as well as relatively positive perception of communication within their organisations. One of the most

typical items representing motivation is "I like my job", and responses from the three groups to this item are shown in Figure 1. As can be seen from this figure, physicians in particular have a high level of motivation, compared to nurses and pharmacists. Regarding the awareness of healthcare staff of own competence, responses to this aspect vary among three professional groups, and, similar to the results about motivation, physicians show a greater degree of awareness of their own competence compared to nurses and pharmacists. The respondents also perceive teamwork within their work group at a reasonably high level. In particular, nurses' perception of teamwork was the most positive and approximately two thirds of nurses agreed that they have good teamwork in their respective hospitals. Compared with these safety culture aspects, satisfaction with management is not high, and the physician's satisfaction was significantly lower than that of the two other professional groups.

One of the most interesting safety culture aspects is *power distance*, which refers to the psychological distance between leaders or superiors and subordinate members. A small power 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 of the survey suggest that there is a relatively small power distance in Japanese hospitals; in addition, no significant difference in perception of this aspect was uncovered between physicians, nurses and pharmacists. For example, 91% of physicians and 90% of nurses disagreed (?2 =2.56; p>0.05) with the item "team member should not question the decision or actions of senior staff except when they threaten the safety of the medical activity". A similar pattern was obtained for the item "senior staff should encourage questions from junior staff during their activities if appropriate", but for this item physicians' agreement was significantly higher than that of the nurses (?2 =13.72; p<0.01), as shown in Figure 2.

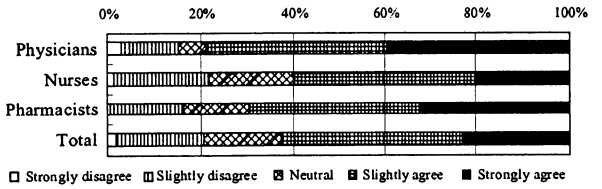

Figure 2 Responses of the item "Senior staff should encourage questions from junior members"

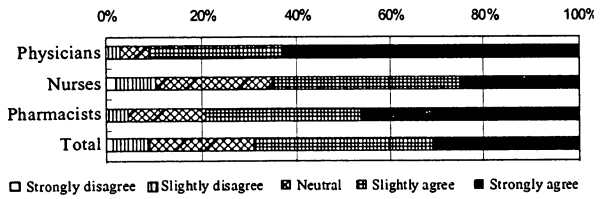

Figure 3 Responses of the item "Human error is inevitable"

A large part of the healthcare staff surveyed showed positive attitudes to and a realistic recognition of human error. As a representative question of this aspect, Figure 3 depicts responses to the item "human error is inevitable". As can be seen from this figure, most respondents agreed with this item (91% and 65% of agreement for physicians and nurses, respectively; ?2 =41.65, p<0.01). They disagreed with the statement that "errors are a sign of incompetence" (80% and 71% disagreement; ?2 =1.92, p>0.05). However, for the item regarding error reporting, "I am encouraged by my leaders and co-workers to report any incidents that I may observe" a largely positive response was observed, but there was a quite large and significant difference in responses to this item between the three professional groups (?2 =79.13, p<0.01). More than 85% of nurses agreed with this question while the percentage agreement of physicians was less than 45%.

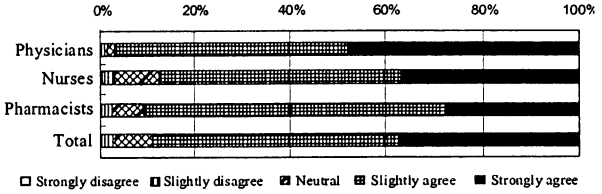

Figure 4 Responses of the item "Team members should monitor each other for signs of stress or fatigue"

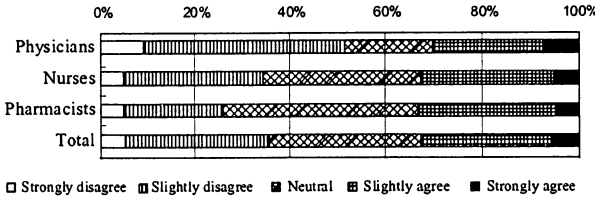

Figure 5 Responses of the item "I am more likely to make errors or mistakes in tense or hostile situations"

Regarding attitudes to stress management for team members, most of healthcare staff recognised the need for monitoring colleagues' levels of stress and workload. For example, more than 90% of respondents agree with the item, "team members should be monitored for signs of stress and fatigue during task" (see Figure 4). In contrast, respondents did not exhibit any great awareness of the effects of stress on their own performance. More than half of the 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", as indicated in Figure 5. Similarly, only 5% of doctors agreed that their performance is reduced in a stressed or fatigued situation (89% disagreement). Percentage disagreement of this item was slightly lower at 78% for nurses.

3.2 Differences between Departments/Wards

Analysis of similarities and differences within the physician group between departments – or rather, specialties, i.e., internal medicine (N=19), surgery (N=22) and others (N=25) – showed no significant differences (with one exception), although the lack of significant differences may be due to the relatively small response samples (type 2 error). The only aspect that turned out to show a significant difference between specialties was awareness of own competence. Thus, the agreement of surgeons was higher by more than 10 percentage points than those of the other two specialty groups.

For nurses, percentage agreements and disagreements of each ward group are shown in Table 2 for all the safety culture aspects, being classified into eight groups: internal medicine (N=129), surgery (138), ICU (intensive care unit; N=39), outpatient (N=55), paediatrics (N=12), mixed ward (N=52), and operating room (N=30). Unlike the department-based analysis of physicians mentioned above, there were significant differences between the nurse's ward groups in several safety culture aspects: communication, stress management for team member, morale and motivation, and recognition of human error. Among the eight groups, two stood out as remarkable types in terms of responses to these aspects. One type comprises nurses working in the operating room and paediatrics.

Table 2 Ward- and position-based comparisons of nurses in safety culture aspects

Safety culture aspects	Ward-based: Internal medicine	Surgery	ICU	Out-patient	Paediatrix	Mixed ward	OR	f / χ^2	Position-based: Ordinary	Chief	Matron	f / χ^2
I. Power distance	% agree	20.0%	22.8%	24.6%	23.7%	24.3%	20.2%	20.7%	13.30	22.7%	19.5%	17.9%	16.92**
	% disagree	61.8%	59.1%	57.1%	61.0%	64.6%	59.9%	62.8%		58.7%	64.7%	68.0%	
II. Communication		87.4%	83.9%	83.3%	88.1%	88.1%	84.6%	90.7%	17.50*	84.1%	90.3%	94.2%	15.66*
		1.7%	5.9%	2.1%	4.5%	3.4%	3.9%	3.3%		4.5%	1.7%	1.3%	
III. Teamwork		66.0%	64.4%	60.9%	66.2%	65.2%	67.3%	68.1%	4.61	66.4%	62.2%	59.2%	5.35
		14.2%	16.3%	13.9%	19.9%	21.7%	14.1%	15.1%		14.5%	17.8%	22.4%	
IV. Own performance under high stress		40.4%	41.2%	43.0%	36.0%	47.7%	41.7%	50.4%	21.30	42.6%	37.4%	36.5%	16.84**
		35.6%	36.8%	31.1%	42.3%	34.6%	29.8%	32.6%		33.6%	38.8%	47.4%	
V. Stress management for team member		71.5%	68.8%	71.1%	71.2%	69.5%	68.0%	65.8%	3.68	67.4%	73.9%	77.8%	11.26**
		14.3%	17.4%	10.5%	15.0%	15.3%	15.8%	19.5%		16.5%	13.4%	13.3%	
VI. Morale & motivation		70.3%	61.7%	62.2%	76.9%	63.2%	59.6%	61.5%	35.40**	61.0%	76.4%	85.3%	74.96**
		12.6%	17.8%	14.5%	10.6%	26.3%	13.6%	17.6%		17.3%	9.8%	6.4%	
VII. Satisfaction with management		55.0%	49.6%	47.4%	56.8%	52.5%	50.2%	48.3%	10.27	48.1%	58.1%	67.3%	31.96**
		26.5%	27.7%	32.6%	32.1%	33.9%	26.7%	34.2%		30.1%	26.8%	16.4%	
VIII. Recognition of human error		64.9%	58.7%	53.3%	61.1%	60.9%	60.9%	67.5%	15.42*	59.7%	63.5%	64.2%	6.37*
		19.5%	21.9%	23.7%	23.1%	26.1%	17.8%	20.8%		20.9%	22.3%	22.8%	
IX. Awareness of own competence		48.9%	42.8%	45.6%	48.0%	42.3%	39.9%	41.8%	12.17	41.7%	49.6%	63.6%	35.01**
		23.0%	25.5%	20.4%	26.3%	32.4%	20.3%	30.5%		26.7%	21.0%	14.4%	

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

Compared to the other ward groups, these ward groups of nurses expressed greater agreement with the importance of communication and they showed a higher level of realistic acknowledgment of their own performance limitations under stress conditions as well as a more realistic acknowledgement of human error, and, finally, a relatively lower level of morale and motivation. Nurses working in internal medicine and with outpatients compose the other ward type. In contrast to the operating room and paediatrics nurses, they had the highest morale and motivation and expressed greater agreements with the items about stress management for team members, but a lower level of appreciation of their own performance limits under stress condition. The latter results might in part reflect differences in tasks and work conditions.

3.3 Differences between Positions

Similar to the results of the department-based analysis, there were few significant differences across positions, i.e., residents (N=9), consultants (N=22) and leaders (N=33), in physicians' responses about safety culture aspects – but again, this result might well be due to the relatively small sample. Only morale and motivation (χ^2 =14.45, $p<0.01$), and awareness of own competence (χ^2 =11.72, $p<0.01$) were found to show significant differences between leaders, consultants and residents. Physicians in a leading position, i.e., heads of department, exhibited the highest morale and motivation and showed the greatest awareness of their own competence. No difference in morale and motivation was observed between consultants and residents, but consultants' awareness of own competence was slightly stronger than that of residents.

In contrast, as shown in Table 2, there were significant differences within the nurse group in responses to all the aspects between their positions, i.e., ordinary (N=354), chief (N=97) and matron (N=32). As an overall trend, nurses at a higher position showed higher morale and motivation and they exhibited more positive or realistic attitudes to management, error recognition and other organisational issues, but they also showed greater power distance. However, opposite patterns of perceptions of own performance under stress condition were indicated between the position groups, that is, ordinary nurses had the most realistic acknowledgment of their own performance limitations under stress conditions.

3.4 Differences between Hospitals

Using response data obtained from nurses – since only a small number of physician's responses were collected from three out of the five hospitals (N=91, 113, 88, 100, and 94) surveyed in this study – we performed hospital-based comparisons of the safety culture aspects. Significant differences were identified in most aspects between the five hospitals: power distance (χ^2 =13.28, $p<0.05$), communication (χ^2 =34.22, $p<0.01$), recognition of own performance degradation under high stress (χ^2 =33.88, $p<0.01$), morale and motivation (χ^2 =39.28, $p<0.01$), satisfaction with management (χ^2 =45.06, $p<0.01$) and recognition of human error potential (χ^2 =15.65, $p<0.01$). These differences may suggest that each hospital has a different style and procedures concerning risk management, error reporting, manuals and checklists, safety training and rules, etc., which shape its own local safety culture.

In our previous study, applying a similar type of questionnaire to railway operators [11], we have elicited responses to question items that can differentiate low-incident and high-incident work units – we call these items "risk-identifying items" – based on integrated results of questionnaire responses and accident and incident statistics, both of which were collected from the same railway operation company. Most of these question items fall into two safety culture aspects: on the one hand, morale and motivation, and on the other, recognition of own performance limitations under stress situation. Results of applying these question items to hospital-based responses of the nurse group are shown in Table 3 in terms of percentage agreement and disagreement as well as chi-square values calculated by the Kruskal-Wallis test. As can be seen in this table, there are significant differences between the five hospitals surveyed in this study for all the risk-identifiable questions except for the item, "I like my job" for which a significance level was at less than 10%. Again, the relatively small sample size may possibly make it more likely that a type-two error is made if we conclude that there is in fact no difference.

Table 3 Hospital-based percentage (dis)agreement of items that differentiated high-/low-incident railway organisations

Items		Hospitals A	B	C	D	E	f Ö
Even fatigued, I perform effectively	%agree.:	78.0%	75.0%	67.0%	62.6%	74.5%	13.92**
	%disagree.:	8.8%	14.3%	15.9%	27.3%	4.3%	
I do my best work when I am alone		93.4%	93.6%	86.9%	82.1%	94.6%	14.80**
		2.2%	0.9%	4.8%	4.2%	0.0%	
My decision-making ability is as good in emergencies as in routine situations.		28.7%	38.9%	26.7%	14.0%	29.3%	32.27**
		28.7%	24.8%	40.7%	54.0%	21.7%	
Regular debriefing is an important part of maintaining effective coordination		72.5%	80.9%	90.8%	91.9%	91.3%	15.18**
		5.5%	4.5%	4.6%	2.0%	2.2%	
I am more likely to make errors in tense situations.		15.6%	34.8%	35.6%	49.0%	27.7%	28.85**
		46.7%	39.3%	26.4%	21.4%	37.2%	
My performance is not adversely affected with an inexperienced team member		42.2%	29.5%	32.6%	27.6%	14.0%	17.54**
		27.8%	32.1%	31.4%	48.0%	44.1%	
I am proud to work for this hospital		37.5%	73.2%	54.5%	59.6%	61.7%	42.48**
		33.0%	8.0%	14.8%	14.1%	16.0%	
A truly professional can leave personal problems during medical activity		62.2%	68.1%	47.7%	49.0%	62.8%	11.51*
		21.1%	19.5%	29.1%	25.5%	16.0%	
I like my job		74.4%	79.6%	79.3%	62.6%	71.0%	8.24
		12.2%	7.1%	8.0%	16.2%	4.3%	

Table 4 Leadership style in healthcare

(a) Style most preferred

	©Autocratic 1	2	Democratic 3	4
Physicians	9.2%	49.2%	24.6%	16.9%
Nurses	5.5%	53.4%	10.1%	31.0%
Pharmacists	4.9%	61.0%	19.5%	14.6%
Ship officers	10.6%	58.6%	23.8%	6.9%

(b) Style most often found

	©Autocratic 1	2	Democratic 3	4
Physicians	39.3%	27.9%	14.8%	18.0%
Nurses	33.0%	28.1%	18.6%	20.4%
Pharmacists	13.3%	43.3%	30.0%	13.3%
Ship officers	45.9%	30.4%	17.5%	6.2%

As an overall trend, nurses working in Hospitals B and E showed relatively high morale and motivation. For example, their percentage agreements of the items, "I am proud to work for this hospital", "I do my best work when people leave me alone" and "I like my job" are higher than nurses in the other hospitals. However, their recognition of effects of stress, fatigue and workload was relatively less realistic than nurses in Hospitals C and D, whose level of morale and motivation was lower than the other hospitals. Similar to the circumstances under which we collected data in the railway survey [11], at the time of the present survey, the healthcare staff involved had not received any training about effects of stress, fatigue, workload and other psychological factors on task performance and quality. In such a situation, these items relating to recognition of one's own performance degradation under high stress might often project the staff's morale. Thus, in the railway study it was found that percentage agreements on these stress-related items were higher – more realistic recognition of stress effects – for high-incident work units, i.e., branches within a company, whose rate of accidents/incidents was higher [11]. Considering the situation in the Japanese hospitals surveyed in this study, there seems to be the same relationship between responses to recognition of stress effects and the level of morale. In a future, when an appropriate training on these issues is provided to the healthcare staff, this relationship may change, i.e., disappear or change its order of correlation.

These results seem to indicate each hospital has its own safety culture, and therefore, if it is legitimate to generalise the relationship between safety culture response and incident risk found in our previous studies of railway, the hospitals may well have different levels of risk of medical adverse events (We are not suggesting, of course, that the level of risk of incident is determined solely by safety culture; only that safety culture is a co-determinant of risk of incidents).

4. LEADERSHIP, TEAMWORK AND WORK GOALS

4.1 Preferred vs. Actual Styles of Leadership

Respondents' perceptions of leadership issues are summarised in Table 4. This table includes responses from Japanese ship officers about the same leadership questions – the survey of ship officers will be briefly mentioned in the next section – for the purpose of professional safety culture comparisons. Desirable leadership may be affected not only by professional culture but also by national culture. Helmreich and Schaefer [7] reported that the "consultative" style – "A leader usually consults with subordinates before reaching decisions. He/she listens to their advice, considers it, and then announces decision. He/she expects all to work loyally to implement it whether or not it was in accordance with the advice they gave." – was supported by more than half of operating room staff in a German hospital. In contrast, in our survey, the style most preferred by the three professional groups in Japanese healthcare as well as by the Japanese ship officers was the "mildly autocratic" style that was described in this way: "A leader usually makes decisions promptly, but, before going ahead, tries to explain them fully to subordinates. He or she gives them the reason for the decisions and answers whatever question they may have". Still, approximately 30% of the nurse group preferred the "democratic" style followed by the "autocratic" style. This may well project a difference of professional culture between physicians and nurses.

In actual workplaces of healthcare, more autocratic styles are frequently found than what the staff desired both in Japan and in Germany – the autocratic style for more than 40% [7]. In Japanese hospitals, as can be seen in Table 4, physicians and nurses found the autocratic style most frequently followed by the mildly autocratic style. The pharmacist's perception of leadership is different from these two groups. They find that the mildly autocratic style is the most frequent, and, in addition, 30% of this group report that the consultative style is what they most often observe. It is noteworthy that both physicians and pharmacists prefer a style of leadership that is *less* "democratic"

Table 5 Perceived Teamwork with healthcare personnel

	Doctors Physicians	Surgeons	f Ö	Nurses Intern.med.	Surgery	f Ö
Internal medicine						
Leader	38.9%	42.1%	1.02	26.3%	• |	9.06
Consultants	55.6%	63.2%	2.15	27.1%	• |	10.44
Residents	41.2%	55.6%	3.82	30.8%	• |	14.82*
Nurses	44.4%	22.2%	5.16	63.7%	31.5%	34.39**
Surgery						
Leader	33.3%	80.0%	9.01*	23.4%	36.8%	14.11*
Consultants	50.0%	89.5%	10.06**	17.5%	33.0%	15.18*
Residents	28.6%	75.0%	6.36*	• |	34.1%	10.50
Nurses	6.7%	73.7%	13.93**	30.8%	51.5%	17.19*
Anaesthesiology						
Leader	21.4%	95.0%	20.12**	• |	• |	• |
Consultants	7.7%	81.3%	17.55**	• |	• |	• |
Nurses	• |	• |	0.58	• |	• |	• |

Figures: % agreement of good teamwork. (rate of "very good" + "good")

or "consultative" than the ones they most often work under, though few of them prefer the outright autocratic style.

Different patterns of preference and perception were observed between specialties of the physician group. Surgeons preferred a more democratic leadership style, i.e., the consultative style (48%) while physicians supported the mildly autocratic style (53%). However, in their actual workplace, the surgeons (50%) found the autocratic style much more frequently than the physician group (33%). There is an almost identical pattern as the one mentioned above across the nurses' ward group.

4.2 Perceived Teamwork in Hospital

In Table 5 is shown respondents' perceptions of "very good" and "good" teamwork within their own groups and with other groups expressed by the physicians and nurses in internal medicine, surgery and anaesthesiology, respectively. We have calculated the percentage agreements of teamwork for each professional staff group for which more than 50% of response were collected from each department/ward group. In this table, a dashed mark ("–") indicates less than 50% responses from each professional group (lack of item response means having no teamwork experience of a respondent with a specific professional group). It is a common pattern of teamwork perception that respondents in each professional group and specialty/ward has the most positive attitudes to teamwork within their own group. For example, the nurse group working in the surgical ward has the most positive teamwork perception of their own group compared with other groups, and so does the internal medicine nurse group. Surgeons' perception is much more positive than the other groups on average. In addition, nurses' perception of teamwork with physicians is very low, even their teamwork with the physician who have the same specialty. On the other hand, physicians do not have the same relatively negative perception of nurses.

Besides these common patterns, there are several specific characteristics of teamwork perception of each group. For example, physicians' perceptions of other specialty groups are much more negative than their perception of their own group, particularly with respective to anaesthesiologists as well as to nurses in the surgical ward. Surgeons' teamwork perception of internal medicine physicians is also quite negative compared to that within their own group. However, surgeon's perception of physicians in another specialty, i.e., anaesthesiologists, is very positive and is similar to their perception of their own group. Finally, the nurse group in the internal medicine ward also perceives teamwork with physicians with whom they frequently cooperate as rather negative, and in fact just as negative as their teamwork with surgeons with whom they seldom work together.

These results suggest that teamwork perception is greatly affected by how much cooperation or collaboration opportunities a given group has another. There are, however, two exceptions, as just indicated: teamwork with surgeons is perceived as being relatively more positive by the other groups, even by those who work less frequently with surgeons. In contrast, teamwork with internal medicine physicians is perceived as being relatively poor even by the groups who frequently work with them.

4.3 Healthcare Staff's Work Goals

Responses of questions on work goals are summarised in Table 6 in terms of rank between fifteen items of the questionnaire as well as percentage agreement for each item. For the purpose of comparing with another professional culture, this table includes the responses from the Japanese pilots obtained by Helmreich and Merritt [6] that applied their early version of questionnaire – two old items were replaced with three new items in their later version, which we applied in the present study. As can be seen in this table, there is little difference in work goals among the three healthcare professional groups. The most important work goal for the Japanese healthcare staff is the interpersonal relationship with collaborators within a hospital such as "working with people who cooperate well with one another" and "maintaining good interpersonal relationship with all other medical personnel".

Next to the most treasured work goals, interpersonal relationship, there is a slight difference with respect to the second-most valued work goal between physicians, nurses and pharmacists, though very minor between the latter two groups. More than 80% of the physician group emphasised work factors such as freedom to adopting their own work procedure, and enough time to consider more than one solution. On the other hand, the physicians' concern with work itself or work content was not high: priority ranks for the work-related items, "job or career that will bring them prestige and recognition from others", "job about which they know everything with no surprise" and "changing work routine with new, unfamiliar tasks" were in the lowest ranks. In contrast, nurses and pharmacists put more stress on personal issues than physicians. More than 80% of these groups put emphasis on security of employment and sufficient time left for their personal or family life.

Table 6 Work goals of each professional group

Work values	Physicians		Nurses		Pharmacists		Japanese pilots[6]
	Rank	%agree.	Rank	%agree.	Rank	%agree.	
Good interpersonal relationships	2	89%	2	93%	2	88%	6
Opportunity for higher-level jobs	10	65%	12	48%	12	61%	8
Security of employment	6	79%	3	88%	3	88%	2
Environment where group's achievement are valued	12	54%	10	61%	11	62%	•|
Live in a desirable area	8	72%	7	80%	9	61%	3
Routine with new, tasks	13	58%	13	41%	13	47%	13
Time to consider solutions	2	83%	5	90%	4	81%	•|
Warm relationship with superior	5	80%	6	84%	6	77%	11
Freedom to adopt own approach	2	89%	9	74%	7	77%	•|
Opportunity for high earnings	9	70%	8	76%	9	58%	7
Challenging tasks to do	7	73%	11	62%	8	70%	5
Know everything about the job	15	17%	14	20%	15	10%	10
Sufficient time for personal life	10	62%	4	88%	5	80%	1
Work with people cooperating	1	97%	1	96%	1	95%	4
Job or career bringing prestige	14	23%	15	21%	14	19%	•|
Find the truth, the one solution	•|		•|		•|		9
Observe strict time limits	•|		•|		•|		12

There are no large differences between positions and in particular between positions of the nurse group. That is, nurses at any level of positions put the highest emphasis on work with people who cooperate well with one another, as well as maintaining good interpersonal relationship with all other medical personnel. For the physician group, there is little difference between leaders and consultants, but the work goal of the residents is slightly different from these two higher position groups. The resident group also put the highest emphasis on work with people who cooperate well with one another (100% of agreement). However, in addition, they also put emphasis on work factors such as freedom to adopt their own approach, time to consider more than one solution, and challenging tasks from which they get a personal sense of accomplishment. No difference was observed between departments or wards both for the physician and the nurse group.

In contrast to the healthcare staff, according to the result by Helmreich and Merritt [6], Japanese pilots attach greater importance to personal issues such as sufficient time left for their personal or family life, security of employment, and life in an area desirable to their family. In addition, pilots also put stress on interpersonal relationships as well as getting challenging tasks giving a personal sense of accomplishment. These differences between healthcare staff and the pilot may in part result from the working style or tasks and it may possibly also be related to the selection and recruitment processes of the professions. In hospitals, healthcare staff members work in teams most of the time, while pilots must frequently work for long periods away from their family, often for many days in a row during long-distance flights.

Table 7 Comparisons with ship officers in percentage (dis)agreement for safety culture aspects

Safety culture aspects		Healthcare staff: Physician	Nurse	Pharma.	Ship officers
I. Power distance	% agree.:	5.7%	8.6%	4.8%	8.3%
	%disagree.:	89.3%	79.2%	87.5%	81.4%
	X_0^2:	11.72**	10.58**		
II. Communication		86.4%	85.4%	85.7%	98.8%
		6.1%	3.8%	7.1%	0.7%
		21.83**	163.69**		
IV. Own performance under high stress		48.6%	42.5%	44.1%	38.3%
		38.4%	34.7%	31.5%	43.1%
		16.92**	53.73**		
V. Stress management for team member		71.6%	67.4%	68.4%	91.5%
		18.7%	17.7%	19.9%	3.0%
		48.16**	294.18**		
VI. Morale & motivation		80.5%	73.9%	71.7%	82.3%
		11.3%	9.5%	12.6%	7.8%
		0.002	61.04**		
VIII. Recognition of human error		36.2%	53.3%	39.3%	50.8%
		47.7%	33.6%	45.2%	36.2%
		17.11**	0.63		

Bottom row : Chi square:between doctors/nurses and ship officers (**: $p<0.01$, *: $p<0.05$)

5. COMPARISON WITH SHIP OFFICERS

For the purpose of comparison with ship officers' attitudes, we used response samples (a subset of questions that overlapped in the two questionnaires) from similar surveys in the maritime domain using an earlier, derivative version of the questionnaire of the present study, the SMAQ (Ship Management Attitudes Questionnaire) [3, 9]. With the SMAQ, we collected 444 samples from Japanese ship officers working in two Japanese ship companies. Comparisons between healthcare staff and ship officers are shown in Table 7 in terms of percentage agreement and disagreement of safety culture aspects. With regard to characteristics of professional culture, a comparison between the two samples show significant differences between physicians/ nurses and ship officers in all the aspects except for morale and motivation (where physicians and officers are alike) and for recognition of human error (where nurses and officers are alike). Both the physician/nurse and the ship officer groups had high motivation and morale. Similar to the hospital work environment, there was not a large power distance on the ship bridge. For the other safety culture aspects, ship officers assign a greater importance to communication during task performance and to stress management for team members than do both physicians and nurses. Moreover, ship officers' attitudes to human error are more realistic than that of physicians and, in terms of percentage agreement, identical to the attitudes of nurses. In contrast, physicians and nurses had slightly more realistic perceptions of the effects of stress on their own performance. Integrating these professional comparisons, we find that the safety culture among ship officers seems to be characterised by a somewhat greater safety awareness than that of hospital staff.

6. CONCLUSION

This paper reported the results of a questionnaire-based survey about safety culture related attitudes among hospital staff. We aimed at identifying safety-related perceptions and attitudes among healthcare staff in relation to patient safety. To elicit characteristics of hospital safety culture, we compared the questionnaire results with the data obtained in our former studies of the maritime domain [3, 9]. Finally, in addition to the healthcare staff attitudes towards managerial issues, we surveyed their perceptions and views of teamwork quality, leadership styles and work goals.

We analysed the healthcare staff's attitudes to safety culture related issues, classifying 57 question items into nine aspects: (1) power distance, (2) communication, (3) teamwork, (4) recognition of own performance degradation under high stress, (5) stress management for team members, (6) morale and motivation, (7) satisfaction with management, (8) recognition of human error potential, and (9) awareness of own competence. As general characteristics of safety culture in Japanese hospitals, we identified a moderate power distance between superiors and subordinate members within these professional groups, appropriate recognition of importance of communication, relatively high morale and motivation, and reasonable attitudes to stress management for team members. However, their satisfaction with management was rather low. In addition, healthcare staff is reluctant to acknowledge degradation of their own performance under high stress, workload, fatigue and other performance shaping and psychological factors. Recognition of human fallibility was reasonably high, but not realistic enough to be fully recognised as a substantial risk factor. Physicians' attitudes to and perceptions of safety culture related issues as well as other issues treated in this paper, cf. statements summarised below, seemed to be homogeneous across positions and specialties – although this conclusion can be made only tentatively, since there is a risk that we might make a "type 2 error" due to the small number of physician samples from individual specialties. On the other hand, differences were observed in most safety culture aspects between positions and wards for the nurse group as mentioned in Sections 3.2 and 3.3.

Respondents tended to judge the quality of teamwork more highly in relation to groups with whom they cooperate more frequently. In addition, surgeons' perceptions of teamwork were more positive than those of physicians, both within their own group and with other specialties. A similar pattern was identified between nurse groups working in surgery and internal medicine. Regarding perceptions of the leadership issue, most of Japanese hospital staff preferred slightly less democratic style than what European doctors and nurses do, i.e., a mildly autocratic style in which a leader usually makes decisions promptly, but tries to explain them fully to team members before going ahead. However, the leadership style that respondents found themselves working under most frequently is the autocratic style – e.g., a leader who usually makes decisions promptly and communicates them to subordinates clearly and firmly a perception identical to results from a German hospital. Finally, the Japanese hospital staff put the greatest emphasis on good interpersonal relationships within their work environment as their work goals. Doctors also stressed the value of working

ways that allow discretion of work procedures and sufficient time given for examining several options to a problem. For nurses and pharmacists personal issues such as security of employment and sufficient time left for their personal or family lives are slightly more important for physicians.

In our former study [8], we derived some hypotheses concerning correlations between the risk of having incidents and some of the safety culture aspects, e.g., recognition of human fallibility, and power distance, based on a comparison between actual reporting statistics of incidents and the questionnaire responses obtained from a single hospital. For example, a particular professional group who has a relatively larger power distance and unrealistic recognition of human errors will be liable to produce a greater number of incidents. In a future study, we will examine the hypotheses based on combined results of a greater number of samples to a questionnaire like the one applied in the present paper and analysis of incident statistics obtained from multiple hospitals.

Finally, based on our efforts to examine the statistical correlations between actual incident rates and the perceptions and attitudes of healthcare staff, we would suggest that a questionnaire-based method may be a useful tool to estimate the present level of safety culture in relation to patient safety in a specific organisation or work unit in the medical domain. This is particularly of importance whenever incident reporting is incomplete or when reporting criteria are heterogeneous. Equally, while incident reporting is a retrospective index of safety levels, survey data may be used prospectively and, in combination with a proactive regime, to identify points at which a specific local safety culture may need to be strengthened.

ACKNOWLEDGMENTS

We are heavily indebted to Robert L. Helmreich, the University of Texas at Austin who provided not only the original "Flight Management Attitudes Questionnaire" and "Operating Team Resource Management Questionnaire" but who also inspired the adaptation of this survey instrument for patient safety. We would like to acknowledge Naomi Kitazawa, Tokyo Medical and Dental University for their cooperation in this project. We are also grateful to the Danish patient safety survey project group for permission to use their cases and question items. Special thanks are due to the hospital heads as well as the risk managers in the hospitals surveyed in this project for allowing us to analyse their incident reports.

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