The Patient Safety Attitudes among the Operating Room Personnel

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ABSTRACT

Background: The first step in cultivating the culture of safety in the operating room is the assessment of safety culture among operating room personnel.
Objective: To assess the patient safety culture of operating room personnel at the Department of Surgery, Faculty of Medicine Siriraj Hospital, and compare attitudes among different groups of personnel, and compare them with the international standards.
Methods: We conducted a cross-sectional survey of safety attitudes among 396 operating room personnel, using a short form of the Safety Attitudes Questionnaire (SAQ). The SAQ employed 30 items to assess safety culture in six dimensions: teamwork climate, safety climate, stress recognition, perception of hospital management, working conditions, and job satisfaction. The subscore of each dimension was calculated and converted to a scale score with a full score of 100, where higher scores indicated better safety attitudes.
Results: The response rate was 66.4%. The overall safety culture score of the operating room personnel was 65.02, higher than an international average (61.80). Operating room personnel at Siriraj Hospital had safety attitudes in teamwork climate, safety climate, and stress recognition lower than the international average, but had safety attitudes in the perception of hospital management, working conditions, and job satisfaction higher than the international average.
Conclusion: The safety culture attitudes of operating room personnel at the Department of Surgery, Siriraj Hospital were comparable to international standards. The safety dimensions that Siriraj Hospital operating room should try to improve were teamwork climate, safety climate, and stress recognition.

Keywords: Safety attitude questionnaire, operating room

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INTRODUCTION

Patient safety is an important issue in the current healthcare system. The top three root causes of sentinel events in patient safety were human factors, leadership, and communication.[1] All these three are related to organization culture.

A widely used framework for improving patient safety is Donabedian model, which categorized safety measures into four areas, (1) structure, (2) process, (3) outcome, and (4) culture. All of the first three measures must occur within the context of an organization culture.[2,3] The safety culture impacts all aspects of patient safety because it affects how personnel implement safety measures. Organizations achieved good safety records by cultivating a culture of safety, which comprises (1) an acknowledgment of error-prone nature of organization's activities, (2) a non-punitive environment for error reporting, (3) collaboration

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across ranks, and (4) a willingness to direct resources to address safety concerns.[4]

Cultivating a culture of safety is not an easy task. The first step involves reliably assessing the safety culture in order to understand which aspect of the culture should receive improvement and whether the intervention actually impacts real changes.

An operating room is a high-risk system that needs attention to prevent medical errors. A traditional operating room possesses many characteristics that would not support the cultivation of safety culture, including hierarchical structure, intimidation of other personnel when making mistakes, or the resistance to make changes to improve safety.[5] In order to make an operating room a safe place for patients, one must first assess the safety culture.

Patient safety culture is defined as a subset of organizational culture, which relates to the values, attitudes, perceptions, and beliefs of healthcare personnel.[6-8] Thus, assessing safety culture involves the evaluation of the collective of attitudes and beliefs of all personnel in the organization. The objective of this study was to assess the patient safety culture of operating room personnel at the Department of Surgery, Faculty of Medicine Siriraj Hospital. Furthermore, we would like to compare safety culture attitudes among different groups of personnel and compare them with the international standards.

MATERIALS AND METHODS

Research design

We carried out a cross-sectional survey of operating room personnel of the Department of Surgery, Siriraj Hospital, which included eight professional groups: surgical faculty members, surgical residents, anesthesiology faculty members, anesthesiology residents, operating room nurses, nurse anesthetists, nurse assistants, and technicians. We distributed the questionnaires in person using a stratified random sampling technique until we reached the targeted sample size for each professional group. After receiving the questionnaire, the operating room personnel could freely choose to complete the questionnaire on voluntary basis with no undue pressure. Our research protocol and questionnaire had been reviewed and approved by The Institutional Review Board (IRB) of Faculty of Medicine Siriraj Hospital. (Si 581/2554)

Questionnaire design

There were nine instruments designed to assess patient safety climate[9]. The Safety Attitudes Questionnaire (SAQ) was the most widely used instrument. The SAQ was applicable to multiple settings, and had demonstrated a relationship with patient outcomes. The SAQ provided measures of safety culture in six dimensions: (1) teamwork climate, (2) safety climate, (3) stress recognition, (4) perception of hospital management, (5) working conditions, and (6) job satisfaction.[9,10] The SAQ has been validated in more than 200 clinical settings in many countries, revealing Cronbach's Alpha of 0.68-0.81.[8,9] The original SAQ employed 60 items. However, a short form has been developed, comprising only 30 items to improve participation. All items were responded on a five-point Likert scale. The short form SAQ had been studied psychometrically, revealing the six dimensions, with Cronbach's Alpha of 0.56-0.80 for each dimension.[10] We thus choose the short form SAQ for this study. We translated the instrument to Thai language and checked its content validity by three independent attending surgeons.

Sample size

We examined the safety attitude questionnaire responses from prior study[11]. We estimated the sample size required to obtain a subscale score with error of less than 5 percent of its average with a confidence level of 95%. From the six subscale scores, the largest sample size estimation was 240. We estimated that only two-thirds of questionnaires would be returned. Thus, we should distribute 360 questionnaires. Furthermore, we also expected missing data in about 10% of the returned questionnaires. Thus, we prepared 396 questionnaires. Considering the total number of operating room personnel at the time was 512, we would approach 77% of operating room personnel.

Analysis

After we input all the data from the returned questionnaires into a computer, we reversed scores of all negatively worded items so that a higher score indicated a better safety culture. We calculated a scale score for each safety culture dimension, which could have values from 0 to 100, where higher values indicate better safety culture attitudes. We also calculated an overall score, which was an average of scale score of all six dimensions. We first examined the characteristics of respondents. We compared the scores obtained from Siriraj Hospital operating room with the international benchmark. We then compared scores between gender and the professional groups. All the analyses were carried out under the assumption of Type I error rate of 0.05.

RESULTS

From 396 questionnaires distributed, we got 263 questionnaires back (66.4% response rate). Respondents were 164 women (62.3%) and 99 men. The characteristics of participants were summarized in Table 1.

The overall safety culture score of the operating room personnel of the Department of Surgery, Siriraj Hospital was 65.02, which was slightly higher than an international average (61.80) obtained from 10,843 healthcare personnel from 203 clinical settings[8]. Cronbach's Alpha of the overall scale was 0.81, which was similar to the findings from prior studies. We also compared the scores for the six dimensions of safety culture with international benchmark. The comparison revealed that operating room personnel at Siriraj Hospital had safety attitudes in teamwork climate, safety climate, and stress recognition lower than the international average, but had safety attitudes in the perception of hospital management, working conditions, and job satisfaction higher than the international average (Table 2). One-sample t-tests revealed that all of these differences were statistically significant.

TABLE 1. The characteristics of survey participants.

Participants	Response rate (n)	Percentage of respondents	Mean age (SD) (yrs)	Female (n)
Surgical faculty members	46% (31/67)	11.80%	42.0 (8.3)	6.5% (2)
Surgical residents	60% (72/120)	27.40%	28.9 (2.1)	34.7% (25)
Anesthesiology faculty members	82% (14/17)	5.30%	40.0 (10.1)	64.3% (9)
Anesthesiology residents	57% (12/21)	4.60%	28.3 (0.9)	91.7% (11)
Operating room nurses	80% (64/80)	24.30%	32.9 (9.5)	95.3% (61)
Nurse anesthetists	78% (11/14)	4.20%	36.9 (9.7)	100% (11)
Nurse assistants	76% (53/69)	20.20%	35.8 (9.8)	83.0% (44)
Technicians	75% (6/8)	2.30%	33.2 (12.5)	16.7% (1)

TABLE 2. The comparison of scores for six dimensions of safety culture with the international benchmark.

	Teamwork climate	Safety climate	Stress recognition	Perception of hospital management	Working conditions	Job satisfaction
Sample size	263	263	261	263	263	263
Average	66.91	65.39	59.13	55.32	64.50	78.90
Standard deviation	12.07	11.07	22.72	14.24	13.19	12.09
Standard error of the mean	0.74	0.68	1.41	0.88	0.81	0.75
International benchmark	69.82	66.84	66.73	46.80	57.33	63.29
t statistics	-3.91	-2.12	-5.40	9.69	8.81	20.92
p values	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01

We compared the scores for the six dimensions of safety culture between professional groups using one-way ANOVA. Except for only safety climate, all other five dimensions showed statistically significant differences between professional groups (Table 3). However, when conducting posthoc pairwise comparisons, the only significant differences were three pairs of stress recognition (surgical residents and operating room nurses, surgical residents and nurse assistants, and anesthesiology residents and nurse assistants) and two pairs of job satisfaction (surgical faculty members and surgical residents, and surgical faculty members and anesthesiology residents).

We compared the scores between genders. Independent-samples t-tests revealed that men's safety attitudes were not significantly different from women's, except for only stress recognition (Table 4).

DISCUSSION

The operating room is a high-risk system that needs a culture of safety. This study revealed some interesting findings regarding the safety culture in the operating room setting of the Department of Surgery, Faculty of Medicine Siriraj Hospital. The safety culture dimensions that Siriraj Hospital had better scores than international averages were perception of hospital management, working conditions, and job satisfaction. This implied that Siriraj operating room personnel were satisfied with actions of the hospital management team, satisfied with their work environment and logistical support of their work, and felt positive about their work experience. On the other hand, three areas that Siriraj operating room personnel scored lower than average included teamwork climate, safety climate, and stress recognition.

TABLE 3. The comparison of scores for six dimensions of safety culture between professional groups.

Professional groups	Teamwork climate	Safety climate	Stress recognition	Perception of hospital management	Working conditions	Job satisfaction
Surgical faculty	71.10	66.71	62.71	51.95	65.66	86.41
Surgical resident	65.96	64.74	70.16	52.84	66.72	76.00
Anesthesiology faculty	65.36	61.99	67.86	45.09	53.13	75.36
Anesthesiology resident	59.72	61.61	75.00	54.86	58.33	69.58
Operating room nurse	69.60	67.89	50.26	58.40	64.00	80.16
Nurse anesthetist	61.82	65.58	54.55	53.79	64.58	83.41
Nurse assistant	65.30	63.43	48.43	58.77	65.06	78.52
Technician	69.44	72.14	56.25	66.67	70.83	83.33
ANOVA						
F statistics	2.21	1.53	8.07	3.20	2.51	4.27
p values	0.03	0.16	<0.01	<0.01	0.02	<0.01

TABLE 4. The comparison of scores for six dimensions of safety culture between gender groups.

Gender	Teamwork climate	Safety climate	Stress recognition	Perception of hospital management	Working conditions	Job satisfaction
Male	67.58	65.38	67.33	53.70	65.11	78.66
Female	66.50	65.40	54.28	56.29	64.13	79.04
t statistics	0.67	-0.02	4.66	-1.43	0.59	-0.25
p values	0.51	0.99	<0.01	0.16	0.56	0.8

Siriraj operating room personnel still struggled with collaboration between team members, commitment of the organization to safety, and the acknowledgment of the influence of stress in their work. These three aspects of safety culture should receive improvement. The most obvious one was stress recognition, which there was a large gap between Siriraj personnel and international average. The hospital administrator should provide an intervention to increase awareness among operating room personnel of the Department of Surgery that stress could impact their performance.

The comparison of safety culture attitudes between professional groups revealed significant differences in all dimensions, except only in safety climate. However, pairwise comparison did not show statistical significance in many pairs despite large score differences. This may be due to small sample size in our subgroups. Nevertheless, significant differences in overall ANOVA test suggested that the professional roles linked to differences in safety attitudes. Different types of intervention targeting different aspects of safety attitudes should be provided for people in different professions.

The comparison of safety culture attitudes between genders suggested that gender did not play significant roles in safety culture in this organization. The only dimension that gender might impact was stress recognition. Male personnel had better awareness that stress could impact the quality of their work. If a hospital administrator planned an intervention to increase awareness of the impact of stress, women personnel should receive more attention.

There are some limitations of the generalizability of the findings from this study. First, significant number of operating room personnel did not participate in this survey. Different groups of personnel showed varied levels of participation, ranging from high cooperation from anesthesiology faculty members (82% response rate) to low level of participation among surgical faculty members (46% response rate). The attitudes of surgical faculty members who did not respond could be different from the findings revealed from this study. Furthermore, we must acknowledge the limitation of survey in assessing safety culture. Survey is an appropriate tool to assess attitudes, perceptions, and beliefs. However, survey cannot measure other aspects of culture like behavior, and competencies. To get a complete picture of patient safety culture, one should consider using other methods to assess these constructs.

CONCLUSION

Safety culture of the operating room personnel of the Department of Surgery, Faculty of Medicine Siriraj Hospital has been evaluated and benchmarked with the international standard using SAQ. The safety culture dimensions that Siriraj Hospital operating room scored higher than international average were perception of hospital management, working conditions, and job satisfaction. The dimensions that Siriraj Hospital operating room needed to improve were teamwork climate, safety climate, and stress recognition.

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REFERENCES

1. Makary MA, Sexton JB, Freischlag JA, Holzmueller CG, Millman EA, Rowen L, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder. J Am Coll Surg 2006;202:746-52.
2. Donabedian A. Evaluating the quality of medical care. Millbank Mem Fund Q 1966;44:166-206.
3. Makary MA, Sexton JB, Freischlag JA, Millman EA, Pryor D, Holzmueller C, et al. Patient Safety in Surgery. Ann Surg 2006;243(5):628-35.
4. Pizzi LT, Goldfarb NI, Nash DB. Promoting a culture of safety. In: Agency for Healthcare Research and Quality (AHRQ), editor. Making health care safer: A critical analysis of patient safety practices. . Rockville, MD: AHRQ, 2001.
5. Chen CL, Cooper MA, Shapiro ML, Angood PB, Makary MA. Patient safety. In: Brunicardi FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG, Matthews JB, et al., editors. Schwartz's Principles of Surgery, 10th ed. New York, NY: McGraw-Hill Education, 2015.p.393-426.

6. Feng X, Bobay K, Weiss M. Patient safety culture in nursing: a dimensional concept analysis. J Adv Nurs 2008;63(3): 310-19.
7. Zimmermann N, Kung K, Sereika SM, Engberg S, Sexton B, Schwendimann R. Assessing the Safety Attitudes Questionnaire (SAQ), German language version in Swiss university hospitals--a validation study. BMC Health Serv Res 2013;13:347.
8. Sexton JB, Helmreich RL, Neilands TB, Rowan K, Vella K, Boyden J, et al. The safety attitudes questionnaire: Psychometric properties, benchmarking data, and emergeing research. BMC Health Serv Res 2006;6:44.
9. Colla J, Bracken A, Kinney L, Weeks W. Measuring patient safety climate: a review of surveys. Qual Saf Health Care 2005;14:364-66.
10. Buljac-Samardzic M, van Wijngaarden JD, Dekker-van Doorn CM. Safety culture in long-term care: A cross-sectional analysis of the safety attitudes questionnaire in nursing and residential homes in the Netherlands. BMJ Qual Saf 2016;25:424-31.
11. Watts BV, Katherine P, West P, Mills PD. Use of the safety attitudes questionnaire as a measure in patient safety improvement. J Pat Saf 2010;6:206-9.