Patient Safety Attitudes Among Respiratory Therapists in Taiwan

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BACKGROUND: Safety attitude surveys have been widely conducted in various disciplines, but not among respiratory therapists (RTs), to assess clinician's awareness of patient safety. We conducted a nationwide survey in Taiwan to assess RTs' safety attitudes in several hospital settings. METHODS: We adapted the Safety Attitude Questionnaire for RTs, and, via the RTs' union, invited all Taiwan RTs to take the survey. The questionnaire assessed safety attitudes in 6 domains: teamwork climate, safety climate, job satisfaction, stress recognition, perception of hospital management, and perception of working conditions. We analyzed the associations between positive attitudes and each domain. RESULTS: The response rate was 60%. Overall, the RTs had low positive attitudes about the teamwork climate (37%), safety climate (21%), job satisfaction (29%), stress recognition (32%), perception of hospital management (24%), and perception of working conditions (21%). The positive attitudes to all safety domains were lower among senior RTs than among junior RTs. The RTs working in the medical centers had higher positive-attitude scores for stress recognition but lower scores for the other 5 safety domains than the RTs working in the (smaller) regional and district hospitals. CONCLUSIONS: Taiwanese RTs had low positive attitudes about the surveyed 6 safety domains in their hospitals. High work load, management of RTs under other professions, and lack of protocol use probably contribute to their low opinions about the patient safety situation and low job satisfaction. *Key words: respiratory therapists; safety; attitudes; culture; teamwork; job satisfaction; stress recognition; management; working conditions*. [Respir Care 2011;56(12):1924–1929. © 2011 Daedalus Enterprises]

Introduction

Elements associated with patient safety in medical care include appropriate and well maintained equipment, a well designed facility, an acceptable patient/clinician ratio, adequate personnel competency, well organized teamwork, and organizational support for patient safety issues.[1] However, medical errors are common, especially in fast-paced critical care areas.[2-4] The incidence of medical error is approximately 12.3 errors per 1,000 admissions, and is approximately 1.7 errors per day in intensive care units

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(ICUs).[5] Medical errors and adverse events often occur when, for instance, there is confusion about drugs with similar-sounding names, equipment is poorly designed, clinicians are fatigued, communication and cooperation within the medical team are poor, or there is understaffing.[6] In addition, ICU medical errors and patient mortality increase with medical and clinical staff shortages.

Safety attitude refers to "the shared attitudes, beliefs, values, and assumptions that underlie how people perceive and act upon safety issues within their organization."[7] Healthcare organizations are becoming aware of the importance of measuring and transforming organizational attitude to improve patient safety.[8,9] Vincent et al analyzed the causes of adverse effects of medical procedures[10] and suggested that performance and safety of medical behavior can be influenced by organizational structure, work environment, teamwork, personnel behavior, and so forth.

Better attitudes about the patient safety situation are associated with shorter stay, fewer prescription errors, less ventilator-associated pneumonia, fewer blood-stream infections, and lower mortality.[11] To improve patient safety and reduce medical errors, several studies have suggested that healthcare organizations should regularly measure employees' safety attitudes.[6,12] Safety attitude surveys have been conducted in several medical disciplines, in individual units, and hospital-wide.[9,13,14] Survey results can help hospital administrators to initiate safety management strategies.

Respiratory therapists (RTs) are important members of the multidisciplinary care team for critically ill patients. Nevertheless, to our knowledge only one study has assessed RTs' patient safety attitudes in the United States. Huang et al[9] studied the perceptions of safety attitude among various disciplines in the ICUs at one institution and found substantial differences between those ICUs. RTs' safety attitudes have never been examined on a national basis in Taiwan, so we surveyed RTs' safety attitudes and compared the differences in RTs' safety attitudes in several hospital settings.

Methods

This study was approved by the institutional review board of Taipei Veterans General Hospital, Taipei, Taiwan.

Adaptation of the Safety Attitude Questionnaire

The Safety Attitude Questionnaire in this study was originally designed by Sexton et al.[14] We selected the Safety Attitude Questionnaire because it is one of the most widely verified psychometric questionnaires on safety attitudes[10-20] and the Chinese version of the Safety Attitude Questionnaire showed good validity and reliability in a recent large survey in Taiwan.[15] In this study we adapted the Chinese version of the Safety Attitude Questionnaire to assess RTs' safety attitudes in Taiwanese hospital settings. We call our version the Safety Attitude Questionnaire for RTs (see the supplementary materials at http://www.rcjournal.com). It contains 32 items in 6 domains: teamwork climate, safety climate, job satisfaction, stress recognition, perception of hospital management, and perception of working conditions. We included 2 reverse-coded items (item 2 and 11) to determine to what extent the respondents carefully read and answered questions.

Our Safety Attitude Questionnaire for RTs requests demographic information, including age, sex, education degrees, work experience as an RT at the survey hospital, and the respondent's primary working hospital levels and clinical locations (eg, ICU or long-term care facility). The medical care system in Taiwan divides hospital types into 3 levels, according to the number of patient-beds, severity of illness, and function: medical center, regional hospital, and district hospital. The medical centers have $>$ 1,000 beds and focus on education, research, and treating critically ill patients with the most severe conditions. The regional hospitals have 500–999 beds, take patients with less severe conditions than the medical centers, and the regional hospitals' primary role is treating chronic and general illness patients. The district hospitals have 100–499 beds, take patients with less severe conditions than the regional hospitals, and treat chronically ill patients during admission and clinic visits. We compared the safety attitudes of RTs from all 3 hospital types.

To assess the correlation between RTs' safety attitudes and the working environments in different hospital levels, we collected the hospitals' information where the respondents had worked for greater than 1 year.

Administration of the Survey

We conducted the safety attitudes survey with the assistance of the Respiratory Therapist Society of the Republic of China, between September 1 and December 31, 2008. The questionnaire was mailed to the directors of the respiratory therapy departments of all the healthcare organizations, and then delivered to individual RTs who were registered with the Respiratory Therapist Society of the Republic of China. We mailed 1,220 copies of the survey. Completed questionnaires were returned to us in sealed envelopes.

Scoring and Analysis

We scored each questionnaire item by converting the 5-point Likert scale score to a 100-point scale as follows: 1 = 0, 2 = 25, 3 = 50, 4 = 75, and 5 = 100. Responses to each item in a given domain were summed and then

Table 1. Demographics of the Survey Respondents (n = 617)

	no. (%)
Male	23 (4)
Female	594 (96)
Education	
Associate degree	166 (27)
Baccalaureate degree	429 (70)
Master's degree	22 (3)
Hospital Category	
Medical center	313 (50)
Regional hospital	201 (33)
District hospital	103 (17)
Age Range (range y)	
21–30	150 (24)
31–40	372 (60)
41–50	88 (14)
51–60	7 (2)
Work Experience (range y)	
< 1	15 (2)
1–5	152 (25)
6–10	241 (40)
11–15	132 (21)
16–20	46 (8)
> 20	31 (5)

divided by the number of items in that domain to create a domain score in the range 0–100. A mean score of ≥ 75 was deemed a positive attitude about a given domain.

We analyzed the internal consistency in each domain with the Cronbach alpha method.[21] We used the Pearson correlation analysis to determine the associations between positive-attitude scores and each domain. We used 1-way analysis of variance and the Scheffe post hoc test to compare the positive scores for each domain to various RT characteristics. All descriptive and comparative analyses were performed with statistics software (SPSS 15.0, SPSS, Chicago, Illinois). P values < .05 were considered significant.

Results

Seven-hundred thirty valid questionnaires were returned, so the overall response rate was 60%. However, 113 questionnaires were discarded due to their being returned incomplete. The reliability analysis showed that all 6 domains had good internal consistency: the Cronbach alpha values were: teamwork climate 0.80, safety climate 0.79, job satisfaction 0.90, stress recognition 0.83, perception of hospital management 0.88, and perception of working conditions 0.75.

Table 1 describes the respondents. About 96% of all respondents were female, 73% had a baccalaureate or master's degree, 84% were 21–40 years old, 75% had ≥ 5 years of RT work experience, and 50% worked in the medical centers.

Table 2 lists the percentages of positive-attitude scores. The male respondents had a significantly higher percentage of positive attitudes than the female respondents in all domains except stress recognition. Respondents with master's degrees had a higher percentage of positive-attitude scores on stress recognition than the respondents with other education levels. There were no significant differences in the other 5 domains between the education levels.

There was a parallel relationship between age and positive-attitude score in all domains. RTs aged 50–60 years had the highest positive-attitude scores in all domains, but some of those differences were not statistically significant due to low sample size. Higher percentages of positive-attitude scores were reported by older RTs. The average of positive-score percentages in all domains were 30, 22, 24, 29, 29, 29, and 50 for RTs with < 1 year, 1–5, 6–10, 11–15, 16–20, and > 20 years of RT work experience, respectively. RTs with ≥ 20 years of RT work experience had significantly higher positive-attitude scores in the teamwork climate, safety climate, job satisfaction, perception of hospital management, and perception of working conditions domains. RTs with 1–10 years experience on average had the lowest positive-attitude scores in all domains among all the work-experience groups.

RTs working in long-term care facilities had significantly higher percentages of positive-attitude scores on teamwork climate and safety climate than those working in ICUs. Respondents working in the medical centers had significantly lower positive safety attitude scores. Fifty percent of the respondents were employed at medical centers, and they had higher stress-recognition scores but much lower positive scores in all other domains.

Discussion

Our results suggest that the safety attitudes of RTs in Taiwan vary by type of institution, education, experience, and age. The respondents had lower positive-attitude scores with respect to safety climate and work climate than RTs in the United States and other professions in Taiwan.[10,15] The patient safety issue appears to get more emphasis with work experience and age. The RTs working in the medical centers recognized their stress more, but responded low on safety attitude.

The positive-attitude scores on the Safety Attitude Questionnaire reflect how much the employers have emphasized patient safety issues. The questionnaire was originally designed by Sexton, and it is one of the most widely verified psychometric questionnaires on safety attitudes.[10-20] The primary factors associated with patient safety climate are employee attitude toward risks and safety, organizational commitment to safety systems, and manag-

Table 2. Percentages of Positive Attitude Scores

	Teamwork Climate	Safety Climate	Job Satisfaction	Stress Recognition	Perception of Hospital Management	Perception of Working Conditions
Overall	37	21	29	32	24	21
Female	36	20	28	28	23	20
Male	58*	42*	58*	35	50*	46*
Education						
Associate degree	40	25	34	28	27	26
Baccalaureate degree	35	19	27	34	22	19
Master's degree	44	26	44	57*	17	22
Age (range y)						
21–30	29	14	19	36	17	13
31–40	37	20	30	30	22	20
41–50	48*	37*	45*	35	37*	38*
51–60	71	57*	71*	57	86*	43
Work Location						
Intensive care unit	35	19	26	35	22	20
Long-term care facility	58*	34*	35	21	37	30
Hospital Type						
Medical center	26	15	21	37	16	17
Regional hospital	43*	22	36*	28	28*	25
District hospital	51*	32*	36*	25	33*	22

* Significant difference.

ers' attitude toward patient safety.[10] The Safety Attitude Questionnaire is divided into 6 domains to examine clinicians' patient safety attitudes in different dimensions. According to Saxon, the teamwork climate domain examines perceived quality of collaboration between personnel; the job satisfaction domain examines positivity about the work experience; the perception of hospital management domain measures employee approval of managerial action; the safety climate domain measures the employee's perception of a strong and proactive organizational commitment to safety; the work-conditions domain measures the perceived quality of the work environment and logistical support; and the stress-recognition domain examines acknowledgment of how performance is influenced by stressors.[16]

There is an association between higher morbidity and mortality and ICU employee work overload, and it has been shown to increase up to 50% in pediatric ICUs when the number of clinicians is reduced by half.[22,23] Therefore, a staff shortage might constitute a threat to patient safety, especially in ICUs. Our survey found that 80% of the RTs in the medical centers reported work overload, with a shortage in the respiratory therapy department. The Taiwan Joint Commission on Hospital Accreditation requires that the ratio of beds to RTs should be 10 to 1 in an ICU, and 30 to 1 in a long-term weaning center.[24] The requirement for total RT number is approximately 3,500. However, currently only 1,600 RTs are registered with the licensing board. Patients might not receive appropriate care at times when RTs have to cover many areas due to the shortage. With the combination of low patient safety attitudes and shortages, the quality of patient care might be insufficient.

Although RTs have an important role in critical care, the number of RTs working in the ICUs is small. Additionally, the respiratory care profession is still in the process of developing in Taiwan. Some RTs are managed under departments of pulmonary medicine, internal medicine, nursing, or intensive care. RTs work as floaters in the ICUs and on the floors, with heavy work load, and sometimes they work in multiple units. Under those circumstances, RTs have fewer resources and lack formal channels for problem-solving when patient safety issues occur. Not being taken into account as part of the critical care team might have contributed to the low perception-of-hospital-management scores, which were far lower than the responses by nurses and physicians.

A recent large survey by Lee et al[15] with the Chinese version of the Safety Attitude Questionnaire collected responses from approximately 40,000 medical and administrative staff in Taiwan, and found a 30–50% positive response rate. In comparison to other professions in Taiwan, the RTs responded much lower on their perceptions of management (24% vs 42%), followed by safety climate (21% vs 37%). The low perception-of-hospital-management score might be attributable to the fact that RTs are managed under other professions.

Kaya et al studied clinicians' perceptions in a neonatal ICU and their implications for team training in that environment,[19] and found that stability of the team members is considered necessary for patient care conditions. A respondent wrote that "when there was a problem with one member or one person in the system, teamwork suffered." When RTs are not available for the critical care team in Taiwan, the safety and quality of patient care may be reduced.

Work overload might be a contributing factor to the low scores on job satisfaction and teamwork climate given by Taiwanese RTs. According to the American Association for Respiratory Care Uniform Reporting Manual, RTs in the United States are assigned approximately 40–50 procedures per 12-hour shift.[25] In comparison, RTs in Taiwan have more than 60 procedures per 8-hour shift, including aerosol therapy, bronchial hygiene, ventilation manipulation, weaning parameter check, lung expansion therapy, airway management, and care of tracheostomy. In general, a Taiwanese RT provides care for more than 13 ventilator-assisted patients in an ICU in a medical center, or 30 ventilated patients in a chronic respiratory weaning center.

RTs in the Huang et al study had much higher job satisfaction and much lower perception of management.[9] The implementation of RT-driven protocols might have contributed to greater job satisfaction in their data. With the RT-driven protocol, RTs assess and treat according to the patient's needs, so care is more dynamic, with more adjustment of respiratory care services. On the other hand, without the RT-driven protocol, the RTs have to perform some unnecessary treatments, and job satisfaction is reduced by work-related physical exhaustion.

The healthcare system in Taiwan provides comprehensive healthcare services for ventilator-dependent patients. RTs in the 3 different types of hospitals responded differently about safety attitudes. Patients in the medical centers usually have acute severe illness, so the medical center RTs have higher stress. The medical center RTs had higher positive scores on stress recognition and lower scores on the other domains. On the other hand, the patients in the regional and district hospitals are in step-down units and have stable disease status. Furthermore, with smaller teams the communication is much easier, vertically and horizontally, so the RTs in the regional and district hospitals had higher positive-attitude scores on most domains.

In Taiwan the healthcare field is dominated mainly by women, who are thought to be more patient and detail-oriented in Chinese culture. RTs registered with the RT licensure board have an 18 to 1 female to male ratio. Male RTs who weren't satisfied with the work conditions or had higher stress might have left the field, so the male RTs remaining in the field responded with higher positive scores. Education level correlated with attitudes about stress response and perception of management. Another study found that higher-level employees have higher stress recognition.[15] Patient safety issues might be managed better when the employees are better able to recognize their own stresses.

Limitations

First, our survey was designed to determine opinions about patient safety recognition. Personal experiences, such as the resources available at the different types of hospitals, or regional factors, might have affected the responses. Further study to determine RTs' safety attitude in different regions might be needed. Second, the results might have been different with a higher response rate, although our response rate was 60%. Third, the survey results might not link to medical adverse events. Studies are needed on the association between safety attitudes and the incidence of adverse events.

Conclusions

RTs in Taiwan had low positive attitudes about the patient-safety culture in their hospitals, but there was substantial variability across the different types of hospitals. High work load, management of RTs under other professions, and lack of RT-driven protocols probably contribute to Taiwanese RTs' low opinions about the patient safety situation and low job satisfaction. The RTs in the medical centers had higher stress recognition but lower opinions in the other 5 domains. RTs in the long-term facilities had more positive opinions about the teamwork climate and safety climate. Low patient safety culture might relate to a higher incidence of medical errors, and studies are needed to identify the association between safety attitude and the incidence of adverse events.

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