

ORIGINAL ARTICLE

MEDICAL PERSONNEL PERCEPTION ON SAFETY ATTITUDE IN A TERTIARY TEACHING HOSPITAL IN MALAYSIA

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ABSTRACT

Evaluation of the perception of safety attitudes among physicians and nurses in hospitals is important to ensure optimum patient care. The objectives are to assess the perception of medical personnel on safety attitudes at their workplace and to measure the correlation between domains and factors studied. A cross-sectional study involving 160 physicians and 304 nurses is conducted at a teaching hospital. A validated Safety Attitudes Questionnaire (SAQ) consisting of 6 domains is used to measure the perception of medical personnel on safety attitude at their workplace. The Mann-Whitney test was performed for the comparison of the mean scores between two categorical variables and Spearman's correlation coefficient was used to evaluate the relationship between two numerical variables in terms of strength and direction. Job satisfaction (73.4 ± 17.6) and management perception (56.1 ± 12.9) domains recorded the highest and lowest mean scores respectively. Doctors showed the highest perceived positive attitudes towards stress identification (57.5%) whereas perception of management (9.4%) has the lowest score, and the nurses showed the highest perceived positive attitudes towards job satisfaction (74.3%), and a low score of perception of management (10.9%). Overall, climate safety and stress recognition domains showed significant correlations with age, level of education, years in specialty, and history of attending safety training. The study results indicated that the medical personnel had low positive safety attitudes towards the management perceptions domain. However, they reported a high level of job satisfaction domain. It is imperative for the management team to take the necessary steps to ensure the personnel develops a positive safety attitude.

Keywords: perception, patient safety, medical error, doctors, nurses

INTRODUCTION

In 1986, after the Chernobyl nuclear power disaster, the terminology of 'safety culture' first appeared in the nuclear agency report by the International Nuclear Safety Group (INSAG) under the Organisation for Economic Co-operation and Development (OECD). Since then, several industries had embraced his concept to ensure the safety of the personnel working in high-reliability organizations (HROs), otherwise known as extremely safe, high-risk organizations. In recent years, the concept of safety culture has been established in the health care setting¹. Based on the definition by the United Kingdom (UK) Health and Safety Executive (HSE), safety culture is "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine commitment, style, and proficiency of the health and safety management of an organization. The characters of organizations with a positive safety culture included i. Communication founded on mutual trust, ii. shared perceptions of the importance of safety, and iii. Confidence in the efficacy of preventive measures². The terms safety culture and safety climate are frequently used interchangeably together to describe attitude. Climate is viewed in broader terms as the observable or measurable part of the culture whereas attitude is seen as a subset of climate

3.

Despite the continued efforts by healthcare organizations to improve the quality of care, the rates of adverse events resulting from medical errors are still high. Based on the Institute of Medicine Report (IOM), an error refers to "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim" whereas an adverse event is known as "an injury resulting from medical intervention, not an underlying condition"⁴. Based on a report released by the World Health Organisation (WHO), medical errors and health-care-related adverse events occurred in 8-12% of hospitalizations⁵. A recent study in the United States found that medical error was the third commonest cause of death⁶. Similarly, an Australian study reported 16.6% of total hospital admissions were harmed by adverse events and subsequently led to permanent disability in 13.7% and death in 4.9% of patients (Sirota,2000). More importantly, 51% of these events were preventable [7]. In other words, patient safety is a vital element to safeguard the quality of health care⁶.

A strong patient safety attitude that is created and maintained in health care organizations is associated with better performance in the organizations. A Lebanese study applied the Arabic version of the Hospital Survey of Patient

Safety Culture Tool among hospital employees in the whole country⁸. From the study, the areas of strength that promoted patient safety included teamwork within units, hospital management support for patient safety, organizational learning, and continuous improvement. In addition, teamwork across hospital units, hospital handoffs and transitions, staffing, and non-punitive response to errors at the national level were aspects that need to be improved to ensure better patient safety⁸. In addition, another study examined the association between safety attitudes and the types of profession. As low as 39% of doctors reported positive attitudes towards safety climate and less than half of the doctors (47%) and nurses (45%) in the study were satisfied with their jobs. Compared to the management staff, healthcare workers had relatively similar but lower perceptions of their working conditions⁸. To date, there is a lack of research on the assessment of safety attitudes among doctors and nurses in worldwide including Malaysia. Thus, this study aimed to determine the perception of medical personnel on safety attitudes at their workplace and the correlation between domains and factors studied.

METHODS

Study design

This cross-sectional study was conducted among doctors and nurses in a tertiary teaching hospital in Kuala Lumpur. As all the departments were under the same hospital management, it was assumed that similar patient safety practices and policies were implemented at all the departments. Data collection was performed between June and August 2019. Using on a confidence level of 95% and a margin of error 5%, the sample size formula for proportions and prevalence³ showed that a total of 350 participants were required. To be included in the sampling frame, the doctors and nurses needed to be working in the hospital for at least the past six months. The 6-month period was required for them to be sufficiently immersed in the working culture of a particular department so that they would be capable to influence others in the workplace or be influenced by the working environment they were in. The study questionnaires (Appendix A) were distributed to all the doctors and nurses who fulfilled the inclusion criteria. Convenience sampling was applied to select the 350 participants based on the nurses: doctors' ratio of 3:1. This was the ratio of nurses to doctors in Malaysian public hospitals as reported by the National Healthcare Establishment & Workforce Statistics (NHEWS).

The data collection was conducted during the Continuing Medical Education (CME) session of each department. A written information sheet containing the purpose of the study was given to

all the potential participants. They were informed about voluntary participation and the anonymity of their responses. The questionnaire began with a cover letter that included details on informed consent and instructions on how to complete and return the questionnaires. The self-administered questionnaires were distributed to the doctors and nurses after obtaining written consent from them. It took 10-15 minutes to complete the questionnaire. Each questionnaire was checked carefully to ensure there was no missing data before being collected back. Questionnaires with missing data were returned to participants to ensure the questionnaire was completed.

Study Tools

Safety Attitudes Questionnaire (SAQ) is a well-validated tool for the measurement of safety attitude in the healthcare sector. It has been adapted and applied in many clinical departments including intensive care units (ICUs), general in-patient wards, emergency medical services, operation theatres, ambulatory clinics, primary care, community pharmacies, and nursing homes³. The SAQ has been proven to have good construct validity, internal consistency, and psychometric properties. The psychometric properties of an instrument are empirical findings that reflect the data collected in a specific setting. A full version SAQ consists of 60 closed-ended questions on how the respondents perceive patient safety at their workplace. There are several versions of the SAQ, each tailored to different clinical settings¹⁰. However, all the versions share 30 identical core questions measured on a 5-point Likert scale. These questions aimed to elicit the respondents' safety attitudes in six domains, namely teamwork climate, safety climate, perceptions of management, job satisfaction, working conditions, and stress recognition. In this study, the validated bilingual (English & Malay) questionnaire was used to adapt to the profile of Malaysian health care professionals¹¹. It consisted of two parts whereby Part A captured the participants' demographic data and Part B comprised the the36-item SAQ. In addition, attendance on patient safety culture training and the number of medical errors reported for the past year were also obtained from the respondents. This study obtained ethical approval from UKMMC and Research Ethics Committee (Code Grant: FF-2019-235). The permission to use the SAQ was obtained from Eric Thomas of the University of Texas while the permission to use the Malay-translated questionnaire was obtained from Harris Shah of The University of Malaya.

Data Analysis

Data analysis was conducted with IBM SPSS version 23.0. Descriptive statistics of the demographic characteristics were presented.

All SAQ scores were converted from the 5-point Likert scale to a 100-point scale, i.e., 1=0, 2=25, 3=50, 4=75, and 5=100. All negatively worded items were reverse scored. To calculate the mean domain score, the summation of responses to each item within the same domain was obtained before being divided by the number of items in the domain. In addition, the percentages of respondents who submitted positive responses (≥ 75 ; agree slightly and agree strongly) for each safety attitude domain were also tabulated. All the analyses were two-sided and a p-value < 0.05 was taken as statistically significant. The Shapiro-Wilk normality test showed that the data were not normally distributed. Therefore, the Mann-Whitney test was performed for the comparison of the mean scores between two categorical variables, i.e., safety culture domains among doctors and nurses. Furthermore, Spearman's correlation coefficient was used to evaluate the relationship between two numerical variables in terms of strength and direction. This included the correlation between overall scores of each domain with demographic variables namely age, income, education level, years of specialty, and attendance on patient safety culture training.

RESULTS

The questionnaires were distributed to a total of 850 doctors and nurses who were potentially eligible respondents. However, only 464 respondents (160 doctors and 304 nurses) completed and returned the questionnaires. Thus, the response rate was 58.0%. Table 1 outlines the sociodemographic and professional characteristics of the respondents. The variables included age, gender, race, level of education, income, clinical department, length of service, certification as a specialist. It also included the number of times they had observed medical errors in the workplace and whether they have attended patient safety courses before. Four out of five (82.3%) of the respondents were females. Most of them (84.7%) were Malays, followed by Chinese (8.6%), Indians (5.2%), and others (1.5%). Slightly more than half (54.7%) of the respondents were less than 35 years old. Most of the respondents had a monthly income of less than RM5,000 (53.2%) followed by income within the range of RM5,000 and RM10,000 (44.6%). Only a small number of them (2.2%) had an income of more than RM10,000. As for the level of education, half of them were diploma holders, followed by respondents with a degree and master's degree. (Table 1a).

Table 1a: Demographic characteristics of respondents.

Demographic characteristics	Respondents (n=464)	Frequency (%)
Gender		
Male	82	17.7
Female	382	82.3
Ethnicity		
Malay	393	84.7
Chinese	40	8.6
Indian	24	5.2
Others	7	1.5
Age group (years)		
< 35	254	54.7
≥ 35	210	45.3
Income (RM)		
< 5,000	247	53.2
5,000 - 10,000	207	44.6
$\geq 10,000$	10	2.2
Level of Education		
SPM/STPM	5	1.1
Diploma	237	51.1
Degree	188	40.5
Master	30	6.5
Ph.D.	4	0.9
Position		
House Officer	30	6.5
Medical Officer/Registrar	114	24.6
Specialist/Consultant	16	3.4
Staff Nurse	268	57.8
Chief Nurse/Matron	36	7.8

More than half of the respondents were staff nurses (57.8%) while Matrons or chief nurses represented 7.8% of the respondents. As for the doctors, most of them were medical officers or registrars (24.6%), followed by house officers (6.5%) and consultants or specialists (3.4%). Most of the respondents (47.4%) had more than 10 years of working experience, followed by 32.1% who had worked between 5 and 10 years. One in five of them (20.5%) worked only less than 5 years at the time of study. The majority of them (62.1%) were

from the nursing department, followed by anaesthesiology (6.7%), emergency (6.5%), paediatrics (5.8%) and other departments. Three-quarters of the respondents (75.2%) had never attended any patient safety culture training. As for the numbers of self-reported medical error events in the past 12 months, as high as 91.4% of the respondents did not report any events while only 5.2% of the respondents reported one event. (Table 1b).

Table 1b: Characteristics of respondents.

Characteristics	Respondents (n=464)	Frequency (%)
Years of specialty (Years)		
< 5	95	20.5
5 -10	149	32.1
> 10	220	47.4
Department		
Anaesthesiology	31	6.7
Clinic	6	1.3
Emergency	30	6.5
Medical	24	5.2
Nursing	288	62.1
Obstetrics & Gynaecology	13	2.8
Ophthalmology	6	1.3
Ears, Neck & Throat	6	1.3
Orthopaedics	17	3.7
Paediatrics	27	5.8
Psychiatry	9	1.9
Surgery	7	1.5
Attended patient safety culture training		
No	349	75.2
Yes	115	24.8
Observed medical error during the last 12 months		
0	424	91.4
1	24	5.2
2	14	3.0
3	2	0.4

RM, Ringgit Malaysia; SPM, Sijil Pelajaran Malaysia; STPM, Sijil Tinggi Pelajaran Malaysia.

SPM is General Certificate of Education (GCE) O-Level equivalent, STPM is GCE A-Level equivalent

The scores of the overall safety attitude domains ranged from 15.3 to 96.8 with a mean score of 65.7±10.2. The domain of job satisfaction recorded the highest mean score among doctors and nurses (73.4±17.6). In contrast, the perception of management had the lowest mean score (56.1±12.9). The percentage of total respondents (doctors and nurses) who reported positive attitudes towards each domain from the highest to lowest was 64.7% (job satisfaction), 42.0% (teamwork climate), 38.4% (stress recognition), 35.6% (safety climate), 35.8% (working condition) and 10.3% (perception of management).

Figure 1 shows the comparison of the percentage of doctors and nurses who reported a positive response in all six domains and the

overall patient safety attitude. For doctors, the domain of stress recognitions (57.5%) recorded the highest positive response among doctors, followed by job satisfaction (46.3%), teamwork climate (36.3%), safety climate (28.1%), working conditions (25.6%), overall patient safety attitude (16.3%), and lastly perception of management (9.4%). As for nurses, job satisfaction (74.3%) was the domain that received the highest positive response followed by teamwork climate (45.1%), working condition (41.1%), safety climate (39.5%), stress recognition (28.3%), perception of management (10.9%) and lastly overall patient safety attitude (12.8%).

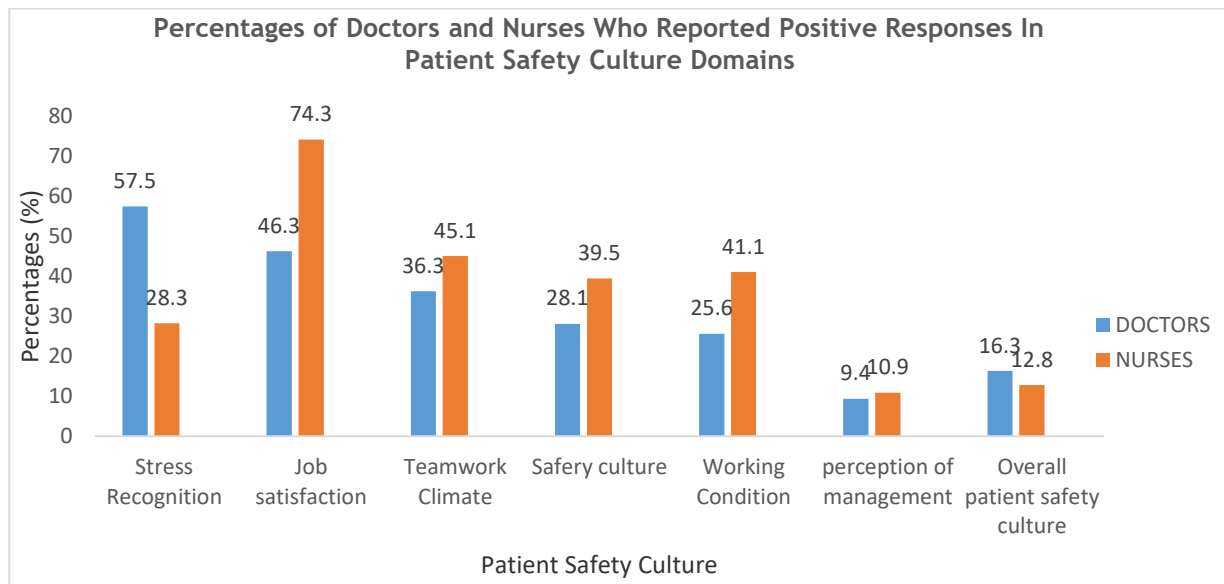


Fig. 1: Comparison of the safety attitude domains among doctors and nurses.

Table 2 shows the comparison of the mean scores for each domain between doctors and nurses. Apart from the stress recognition domain, nurses scored higher than doctors in all

domains. The mean score differences between the two groups were significant for all six domains.

Table 2: Comparison of the mean scores of patient safety domains between doctors and nurses.

Domain	Respondents	n	Mean Rank	Sum of Ranks	P value
Teamwork climate	Doctors	160	212.74	34039.00	0.021
	Nurse	304	242.90	73841.00	
	Total	464			
Safety climate	Doctors	160	193.65	30984.00	<0.001
	Nurse	304	252.95	76896.00	
	Total	464			
Job satisfaction	Doctors	160	192.40	30783.50	<0.001
	Nurse	304	253.61	77096.50	
	Total	464			
Stress recognition	Doctors	160	291.51	46641.00	<0.001
	Nurse	304	201.44	61239.00	
	Total	464			
Perception of management	Doctors	160	202.90	32464.50	<0.001
	Nurse	304	248.08	75415.50	
	Total	464			
Working condition	Doctors	160	201.04	32166.00	<0.001
	Nurse	304	249.06	75714.00	
	Total	464			
Overall patient safety attitude	Doctors	160	211.63	33860.00	0.015
	Nurse	304	243.49	74020.00	
	Total	464			

Table 3 outlines the correlations between patient safety domains and age, income, education level, years of specialty, and history of attending patient safety training. There were significant positive correlations between safety climate and age, level of education, years of specialty, and history of attending patient safety training. Job satisfaction showed a significant positive correlation with years of specialty. Stress recognition showed a significant positive correlation with all the domains while the perception of management

showed a significant positive correlation only with income and level of education. No correlation was found between the socio-demographic characteristics with teamwork climate, working condition domain, or overall patient safety attitude.

Table 3: Correlations between patient safety domains and age, income, level of education, years of specialty, and history of attending patient safety training using Spearman Rho correlation test.

Domain		Age	Income	Level of education	Years of specialty	Attended patient safety training
Teamwork climate	Correlation Coefficient	.030	-.051	.000	.053	.061
	Sig. (2-tailed)	.515	.269	.992	.255	.186
	N	464	464	464	464	464
Safety climate	Correlation Coefficient	.097	-.085	-.103	.122	.100
	Sig. (2-tailed)	.037	.067	.026	.008	.031
	N	464	464	464	464	464
Job satisfaction	Correlation Coefficient	.084	-.028	-.053	.109	.048
	Sig. (2-tailed)	.070	.544	.257	.019	.305
	N	464	464	464	464	464
Stress recognition	Correlation Coefficient	-.141	.158	.222	-.169	-.079
	Sig. (2-tailed)	.002	.001	.000	.000	.091
	N	464	464	464	464	464
Perception of management	Correlation Coefficient	-.079	-.120	-.128	-.007	.045
	Sig. (2-tailed)	.091	.010	.006	.876	.333
	N	464	464	464	464	464
Working condition	Correlation Coefficient	.027	-.035	-.071	.021	.064
	Sig. (2-tailed)	.555	.450	.128	.651	.169
	N	464	464	464	464	464
Overall patient safety attitude	Correlation Coefficient	.007	-.017	-.008	.029	.067
	Sig. (2-tailed)	.872	.718	.859	.531	.148
	N	464	464	464	464	464

N, frequency; Sig, significance.

DISCUSSION

This study had a response rate of 58%, which was relatively low compared to the international benchmark of safety culture (66-72%)¹¹. It was also lower than similar research that applied the same instrument, namely the Swedish study done in community pharmacies (60.2%)¹² and another two studies in the United States, namely in an Intensive Care Unit (70.2%) (The Health Foundation, 2011) and an ambulatory center (69%)¹³. This might be due to the short duration of the study period whereby all the questionnaires were distributed and collected within two months.

In terms of the mean scores of the safety domains, this study recorded a higher score in five out of the six domains compared to the international benchmark, namely job satisfaction (73.4 vs 63.6), teamwork climate (69.8 vs 68.5), safety climate (67.8 vs 65.9), working condition (63.5 vs 55.9), and perception of management (56.1 vs 46.4). In contrast, stress recognition in this study had a lower score than the international benchmark, thus indicating that our respondents had lower awareness of the fact that certain factors such as fatigue, heavy workload, and tense or hostile environment can result in medical errors. Furthermore, the study results showed that the highest score was obtained in the job satisfaction domain. This indicated that doctors and nurses in the study centre had higher positivity in staff morale, pride in the organization, and general contentment towards their workplace. This result echoed the sentiments of research findings from the UK¹², Egypt¹⁴, and Brazil¹⁵ all of which reported the job satisfaction domain with the highest score among all the safety culture domains.

On the contrary, the perception of management had the lowest mean score, like the results in other studies^{6,12}. This could possibly be explained by the disenfranchised feeling among some of the staff, especially in terms of a reduced sense of autonomy in the workplace. Staffing, one of the questions under the domain of perception of management, recorded a very low score among the respondents. It is closely related to the increased workload resulting from a lack of staff and increment in the patient volume. Coupled with high and sometimes unrealistic expectations from other healthcare professionals, all these could compromise patient safety. It has also been reported in previous studies that the availability of sufficient attendants would translate into consistent support for the nurses and result in high-quality patient care¹⁷. In turn, they experienced increased job satisfaction that would reduce occupational burnout and staff turnover. In other words, a higher score in the staffing section indicated an increased

likelihood of better perception of safety among respondents and subsequently a higher possibility of reporting a higher patient safety grade¹⁷. In addition, one of the study aims was to compare patient safety attitudes between doctors and nurses. According to Relihan et al., nurses gained higher mean scores than doctors in all six domains of SAQ, except for perception of management and working conditions¹⁸. In comparison, the nurses in this study reported a higher mean score in all six domains except for stress recognition. This could be explained by the long hours of contact between nurses and patients, thus enabling the nurses to develop a better patient safety attitude compared to the doctors. Such an attitude would cast a direct positive impact on the quality of patient care. In addition, doctors might have a higher stress recognition score due to the unpredictability of their daily work.

Furthermore, our study also highlighted the correlation between safety attitude and several sociodemographic factors. It was found that study respondents who were older than 35 years reported significantly higher safety attitudes. One study also reported age as a significant factor in which younger respondents (<30 years old) showed significantly poorer perceptions of patient safety attitude^{19,20}. In another study performed in a Saudi teaching hospital, found that the respondents between 30 and 45 years old had a significantly lower perception of patient safety¹⁶. Additionally, age was also significantly related to stress recognition. Healthcare personnel above 35 years old were better at acknowledging and handling the influence of stressors on their performance due to their longer working experience compared to their younger counterparts.

Next, it was eye-opening to find that most of the respondents had never attended any patient safety attitude training. Those who had previously attended patient safety training had a better perception of safety attitude. This was in line with a Middle Eastern study that discovered that staff without previous training in patient safety courses or lectures reported poorer perceptions of patient safety than those who had received the training¹⁹. In other words, participation in patient safety programs led to a higher patient safety attitude score, as shown in a Swedish study²¹. This could be due to a higher awareness among the staff to focus more on patient safety issues after attending the patient safety program.

Moreover, the years of specialty were found to be significantly related to safety climate, job satisfaction, and stress recognition. As years of specialty increased, the safety climate and job satisfaction also increased. With longer experience, they had more experience in the workplace, thus accounting for a better safety

climate. Similarly, those who had long years of specialty tended to be promoted to a higher position with better income, thus explaining their better job satisfaction. A Taiwanese study found that dental workers who worked for more than 10 years in the same facility had a better score in the safety attitudes²². In another study, however, Chi et al reported that years of working experience negatively influenced the teamwork climate, safety climate, job satisfaction, and perception of management²³. In other words, this study claimed that employees with less working experience had higher job satisfaction than those who were more experienced. However, in this study, we found that as years of specialty increased, stress recognition decreased as the staff would have adapted to their working condition compared to the less experienced workers.

In addition, the level of education also influenced stress recognition in a positive manner. The perception of management decreased because of stress recognition as the higher level of knowledge would enable the doctors and nurses to learn to handle their stress better. Furthermore, with more knowledge, they could contribute more ideas for the betterment of management. This was like other literature that showed an association between the higher education levels of nurses and improved patient outcomes^{24,25}. As for income, it was significantly related to the domains of stress recognition and the perception of management. As income increased, stress recognition increased while the perception of management decreased. This could be partial since those with higher incomes had to access to more resources to better recognize and handle their stress. As for the perception of management, respondents with higher incomes were likely from a higher position, thus making them more experience and having have more ideas to improve the effectiveness of the management.

Limitations

Despite being one of the first studies in Malaysia on the patient safety attitude among healthcare professionals, it has several limitations. The patient safety attitude measured in this study was not linked to any patient outcomes. Therefore, this study could not conclusively determine the impact of patient safety attitude on patient outcomes. Additionally, the cross-sectional design limited the use of causal inference of the findings. Furthermore, convenience sampling, the method used in this study, was prone to sampling bias. While the respondents in this study shared similar characteristics to those reported in the Malaysian Health Review System Survey, it might not be generalizable to all the healthcare professionals. Therefore, future studies should consider a nationwide sampling of larger

numbers of doctors and nurses in different types of hospitals. This will enhance the generalisability and reliability of the findings so that any differences between doctors and nurses could be delineated. Finally, the measurement of safety attitude should also be assessed by qualitative methods such as in-depth observational studies to complement the quantitative data. We believe that this is one of the first studies in Malaysia that focused on the assessment of patient safety attitudes among doctors and nurses in a tertiary hospital. Apart from providing a benchmark for our institution, this study also paves the way for similar studies to be done in other healthcare facilities. The study findings will provide valuable information in planning further interventions to reduce the incidence of medical errors to ensure a better quality of patient care.

CONCLUSION

The study found a higher agreement among nurses with the overall SAQ questions and scales compared to the doctors. This indicated that nurses had a better perception of patient safety attitude than doctors in UKMMC. Doctors reported the highest score in the stress recognition domain while nurses had the highest score in the job satisfaction domain. Both doctors and nurses recorded the lowest score in the domain of the perception of the management. These findings call for the steps to enhance patient safety attitude in the institution. By using the study results, the necessary remedial actions can be put in place by identifying the specific domains that require improvement. Continuous assessment of patient safety culture should be institutionalized, and appropriate interventions should be encouraged.

ACKNOWLEDGEMENT

We would like to thank the Hospital Director and all the Heads of Department at Universiti Kebangsaan Malaysia Medical Centre (UKMMC) for their cooperation.

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