



## Research Article

## Factors Affecting the Perception of Importance and Practice of Patient Safety Management among Hospital Employees in Korea

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## SUMMARY

**Purpose:** The study was undertaken to identify factors affecting perception of the importance and practice of patient safety management (PSM) among hospital employees in Korea.

**Methods:** This study was conducted using a descriptive design and a self-report questionnaire. Two hundred and eighty employees were recruited from three hospitals using a convenience sampling method. Measures were perception of the importance, practice, and characteristics of PSM. Data were analyzed using descriptive statistics including *t* test, one-way analysis of variance, Pearson's correlation analysis, and multiple regression.

**Results:** Factors affecting perception of the importance of PSM were whether hospital employees were in contact with patients while on duty, weekly working hours, education on PSM, and perceived adequacy of PSM system construction. Factors affecting the practice of PSM were perceived adequacy of work load, perceived adequacy of PSM system construction and perception of its importance.

**Conclusion:** The findings of this study indicate a need for developing strategies to improve perception of the importance and practice of PSM among all hospital employees, and provide a reference for future experimental studies.

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## Introduction

Safety, defined as a state free from physical and psychological damage, is a basic requirement that should be satisfied not only in the home, workplace, and community, but also in medical institutions. Patients and their families expect safe care during admission and treatment in hospitals. Accordingly, safe treatment in a safe environment is a basic patient right and a basic duty of hospital employees (Kim, Kang, & Kim, 2007). Patients' rights and medical practitioners' duties regarding safety are often taken for granted. However, number of disabilities, deaths, and legal disputes caused by medical errors has steadily increased, while patients and families have become more anxious about safety in hospital, and trust in medical staff and hospitals has been eroded (Kohn, Corrigan,

& Donaldson, 2000; Shon, 2006; World Health Organization, 2011). In particular, accidents caused by clinical blunders directly impact patient health and life, and result in financial losses due to extended hospital stays and increased medical fees (Dupree, Anderson, McEvoy, & Brodman, 2011; Jeong, Seo, & Nam, 2006).

Over the past decade, various studies and activities have been conducted in the United States to prevent accidents and to provide safer medical services (Davies, Nutley, & Mannion, 2000; Sammer, Lykens, Singh, Mains, & Lackan, 2010; White, 2011). The Institute of Medicine raised the seriousness of malpractice problems in the publication "To Err Is Human: Building a Safer Health System" (Kohn et al., 2000). The Agency for Healthcare Research and Quality is promoting four projects to guarantee patient safety which includes (a) identification of factors threatening patient safety, (b) development and evaluation of effective clinical standards for patient safety, (c) education, distribution and application of effective clinical standards for patient safety, and (d) continuous evaluation and monitoring for patient safety. In addition, the Joint Commission on Accreditation of Health

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Organization announced national patient safety goals in 14 areas and international patient safety goals in 6 areas, and has been monitoring whether medical institutions adequately meet these goals. Its subordinate institution the Joint Commission International (JCI) also emphasizes the importance of accurate patient identification, effective communication, enhanced safety related to high-risk drugs, activities to prevent wrongful surgery, hospital infection reduction/prevention activities, and fall risk reduction/prevention activities. JCI are applying these items to international medical institutions.

In Korea, interest in patient safety and medical service quality management has recently increased. In response to this trend various studies and activities related to patient accidents are being conducted and individual hospitals are promoting restructuring and evaluation to prevent and control these accidents (Kim, 2009; Kim et al., 2010). However, these efforts are still in their infancy. Few systematic studies related to patient safety, such as studies on risk factors, frequencies, causes, mortalities, and morbidities have been conducted. Consequently, much remains to be done before patient safety management (PSM), including the control of situations known to be associated with accidents in hospital, becomes a reality (Ahn, 2006; Kim, 2004; Kim, Kang, An, & Sung, 2007). Furthermore, the majority of medical institutions has declared interest in only the structural aspect of creating a safe environment and has failed to properly address patient safety nursing education and to do away with the culture of rebuking those responsible (Kim, 2009; Nieva & Sorra, 2003; Noh, 2008). Accordingly, the efforts being made to identify the causes of repeat accidents in complicated medical environments and to prevent such accidents are flawed (Choi, 2009; Park, 2008).

In order to achieve effective PSM in hospitals, it is necessary to strengthen hospital employees' autonomous management systems in addition to providing regulations and guidelines on PSM. Despite these requirements, most studies conducted in Korea (Je, 2007; Jeong et al., 2006; Kang, Kim, An, Kim, & Kim, 2005; Kim, Hwang, Kim, & Oh, 1998; Park, Kim, & Jin, 1996) have focused on accidents in hospitals and people's perceptions of patient safety culture. Few have conducted empirical research on hospital employees' perceptions of the importance and practice of PSM. Furthermore, the majority of previous studies (Jeong et al., 2006; Kang et al., 2005; Kim, Kang, An, et al., 2007) were conducted using nurses or doctors as participants. Few studies (Je, 2007; Noh, 2008) included nurses, doctors, pharmacists, medical technicians, and office workers. The number of respondents in these job categories were too small to identify safety-related characteristics for each category.

Thus, the present study was undertaken to measure the perceptions of the importance and practice of PSM and to identify factors affecting the perceptions of its importance and practice in various types of hospital employees, and ultimately to provide the basis for promoting the autonomous practice of PSM by hospital employees.

### Objectives

The objectives of this study were to measure hospital employees' perceptions of the importance and practice of PSM and to identify factors that affect its importance and practice. More specifically, the study goals were as follows: First, to examine hospital employees' characteristics in relation to PSM, including perception of the importance and practice of PSM; second, to identify differences in perception of the importance and practice of PSM according to hospital employees' characteristics; third, to identify factors affecting hospital employees' perceptions of the importance and practice of PSM.

## Methods

### Study design

This study was conducted as a descriptive survey to measure hospital employees' perceptions of the importance and practice of PSM and to identify factors affecting them.

### Setting and samples

The participants were general employees working at three tertiary hospitals (A, B, C) in Korea. Each hospital has more than 1,000 beds. Considering job content and the degree of direct and indirect contact with patients, we recruited 280 hospital employees including nurses, doctors, nursing assistants, medical technicians (radiological technologists, medical technologists), and those with other job categories (office workers, pharmacists, and nutritionists). The number of participants from each hospital were 79 (A hospital), 98 (B hospital), and 103 (C hospital). General position and full-time employees were included, but the manager position of each job category were excluded because we only wanted to evaluate employees who contact and provide care to the patients directly. Using G\*Power 3.1.2 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, North Rhine-Westphalia, Germany) for power analysis, the power was .99 for linear multiple regression analysis, a medium effect size of .15, and a significance level of .05. The sample size of 280 was satisfactory for identifying factors affecting employee perception of the importance and practice of PSM.

### Measurements

#### Perception of the importance of PSM

The questionnaire was designed to measure degree of hospital employees' perception regarding the importance of patient safety and health, and was regarded as being potentially useful in terms of measuring perception of the importance required for autonomous practice. Prior to developing a questionnaire, researchers analyzed the questionnaire of Kang (2007) for measuring employees' perception of the importance on occupational safety and health. Then, 21 questions were generated and adapted for the objectives and participants in the present study through literature review. The content validity of the questionnaire was tested by a professor and three doctoral students in nursing. The face validity of the questionnaire was tested by nurses, doctors, nursing assistants, medical technicians and office workers ( $n = 2$  from each group); its content relevance and content coverage were confirmed. Sample questions are as follows: I have an interest in the management of patient safety; I tend to place PSM on the priority list at work; I tend to emphasize PSM to my colleagues. Responses were rated using a 5-point Likert scale (1 = *absolutely not*, 5 = *absolutely yes*), and average scores were used. A higher average score indicated a higher perceived importance of PSM. In terms of reliability, the questionnaire had a Cronbach's  $\alpha$  of .85.

#### Practice of PSM

The questionnaire was designed to measure degree of hospital employees' practice for protection of patient safety from medical accident or errors. The questionnaire was developed to measure the extent of hospital employees' practice of PSM. Prior to developing the questionnaire, researchers analyzed an evaluation tool for measuring the practice level of PSM by Korea Health Industry Development Institute (2007) and the elements of the international patient safety goals outlined by JCI (2008). The questionnaire was composed of 21 questions to evaluate practice characteristics of PSM for all hospital workers. The questionnaire was tested for

content validity by a group consisting of a professor and 3 doctoral students in nursing. The face validity of the questionnaire was tested by nurses, doctors, nursing assistants, medical techniques, and office workers ( $n = 2$  from each group). Sample questions are as follows: I check my patients before working for the practice of PSM; I frequently monitor fire risk for my patients' safety. Responses were rated using a 5-point Likert scale (1 = *absolutely not*, 5 = *absolutely yes*), and average scores were used. A higher average score indicated a higher practice of PSM. The questionnaire was found to have a Cronbach's  $\alpha$  of .92, thus confirming the reliability and homogeneity of the questionnaire.

### Procedures

Data were collected from December 1, 2009 to February 28, 2010. Before starting the study, approval was obtained from the institutional review board of the nursing college of Y university. For data collection, researchers visited the relevant department of each institution, explained the objectives of the study to the head of department, received his/her permission to collect data, and obtained a list of employees in the department including their office telephone numbers. The researchers called a total of 450 employees, 150 from each hospital (30 in each job category of nurse, doctor, nursing assistant, medical technician and others), and explained the purposes and content of the study. Researchers obtained oral consent to participate from 300 employees (66.7% response) on the phone. On a date designated by each employee, researchers visited the employee's office, and asked the employee to complete a consent form and the questionnaires. A total of 300 questionnaires were distributed and 280 questionnaires (93.3%) were returned and used for final data analysis. Employees were reassured of the confidentiality of the data obtained. Completed questionnaires were sealed in an unmarked envelope to increase the validity. All procedures were in held in the enclosed space of the department.

### Data analysis

Data were analyzed using PASW statistics 17.0 (PASW, Chicago, IL, USA). To describe the sample, we used descriptive statistics for participants' demographics, and work-related and PSM-related characteristics. Differences between perceptions of the importance and practice of PSM according to the variables were analyzed using  $t$  test and one-way analysis of variance. The relationships between perception of importance and practice of PSM and the variables were analyzed using Pearson's correlation coefficients. Finally, factors affecting employees' perceptions of the importance and practice of PSM were identified by stepwise multiple regression. Results were evaluated using 95% confidence intervals, and the level of significance was set at  $p < .05$ .

## Results

### Participant characteristics

Table 1 shows the demographic characteristics of the employees. The cohort was composed of nurses (24.3%), doctors (19.3%), nursing assistants (18.6%), medical technicians (18.6%), and office workers, pharmacists, and nutritionists (19.3%). Most participants were in contact with patients while on duty (91.4%). Average weekly working hours was 51.0 hours. For perceived adequacy of workload, the most frequent answer was *average* (30.4%) and the least frequent was *very high* (1.8%). Regarding characteristics related to PSM, the majority of participants had received education on PSM (60.5%), but had not been involved in reporting on

PSM (70.0%). The most frequent answer of perceived adequacy of the PSM system was *average* (50.7%), while the least frequent answer was *very low* (2.2%). Average score for perception of the importance of PSM was 3.18 and the average score for practice of PSM was 3.56.

### Differences between perception of the importance and practice of PSM according to employee characteristics

The perception of the importance of PSM did not significantly differ by gender or education ( $p = .712, .380$ ). Regarding differences according to work-related characteristics, perception of the importance and practice of PSM did not significantly differ by hospital ( $p > .05$ ). Nurses showed the highest mean value, while doctors showed the lowest mean value ( $F = 24.56, p < .001$ ); employees who had contact with patients while on duty showed significantly higher mean value ( $t = 12.25, p = .001$ ) than those who did not. Employees whose perceived workload was less than average showed the lowest mean value ( $F = 6.64, p < .001$ ) and those who were dissatisfied with the job showed the lowest mean value ( $F = 3.36, p = .010$ ). According to PSM-related characteristics, employees who were educated on PSM showed higher mean value than the others who were not ( $t = 54.55, p < .001$ ). Those who were experienced in reporting on PSM ( $t = 11.66, p = .001$ ), and those whose workplace which maintained PSM guidelines showed higher mean value ( $t = 12.89, p < .001$ ) than those who did not have any experiences or whose workplace did not maintain PSM guidelines. Also, the perceived adequacy of PSM system construction ( $F = 13.11, p < .001$ ) was significant. In particular, the mean value of perception of the importance of PSM was the highest among employees with a *very high* perceived adequacy of the PSM system.

As to differences according to work-related characteristics, the practice of PSM was highest in nurse and medical technician group ( $F = 20.91, p < .001$ ). The group that had contact with patients while on duty ( $t = 10.46, p = .001$ ) was significantly associated with a higher practice of PSM. Employees who perceived adequacy of workload as *very high* ( $F = 8.01, p < .001$ ) were significantly associated with a lower practice of PSM. Perceived job satisfaction ( $F = 5.40, p < .001$ ) was also significant, showing the lowest mean value in the dissatisfied group. According to PSM-related characteristics, employees who were educated on PSM showed higher mean value than the others who were not ( $t = 30.24, p < .001$ ). Those who were experienced in reporting on PSM ( $t = 6.86, p = .009$ ), and those whose workplace maintained PSM guidelines showed higher mean value ( $t = 14.71, p < .001$ ) than those who did not have any experiences or whose workplace did not maintain PSM guidelines. In addition, perceived adequacy of the PSM system construction ( $F = 13.79, p < .001$ ) was statistically significant. In particular, the mean value of the practice of PSM was the highest in those who perceived the adequacy of PSM system construction as *very high* (Table 2).

### Relations between participants' characteristics and their perceptions of the importance and practice of PSM

Perception of the importance of PSM was found to be significantly correlated with education on PSM ( $r = .41, p < .001$ ), perceived adequacy of the PSM system construction ( $r = .40, p < .001$ ), perceived adequacy of workload ( $r = .25, p < .001$ ), whether the employee was in contact with patients while on duty ( $r = .21, p = .001$ ), whether PSM guidelines were maintained in the workplace ( $r = .21, p < .001$ ), experience in reporting on PSM ( $r = .20, p = .001$ ), hospital work experience ( $r = .16, p = .008$ ), and age ( $r = .15, p = .016$ ). On the other hand, perception of the

**Table 1** Characteristics of Participants (N = 280)

Characteristics	Categories	n <sup>a</sup> (%)	M ± SD	Range			
Demographic	Gender	Male Female	90 (32.3) 189 (67.7)				
	Age (yr)		34.09 ± 7.75	20–57			
	Education	≤High school College ≥Master	36 (13.0) 203 (72.5) 41 (14.5)				
Work-related	Hospital	A B C	79 (28.2) 98 (35.0) 103 (36.8)				
		Job	Nurse Doctor Nursing assistant Medical technician Others <sup>b</sup>	68 (24.2) 54 (19.3) 52 (18.6) 52 (18.6) 54 (19.3)			
			Whether in contact with patients while on duty	Yes No	256 (91.4) 24 (8.6)		
	Work experience (mo)			110.60 ± 96.07	1–456		
	Weekly working hours (hr)		51.00 ± 24.21	8–150			
	Perceived adequacy of work load	Very high High Average Low Very low	5 (1.8) 72 (26.1) 84 (30.4) 75 (27.2) 40 (14.5)	3.26 ± 1.06	1–5		
		Perceived job satisfaction	Very satisfied Satisfied Average Dissatisfied Very dissatisfied	37 (13.4) 91 (33.0) 99 (35.8) 33 (12.0) 16 ( 5.8)	2.64 ± 1.04	1–5	
			PSM-related	Education on PSM	Yes No	167 (60.5) 109 (39.5)	
				Experience in reporting on PSM	Yes No	82 (30.0) 191 (70.0)	
			Whether to maintain guidelines for PSM in workplace	Yes No	160 (58.0) 116 (42.0)		
			Perceived adequacy of PSM system construction	Very high High Average Low Very low	13 ( 4.7) 91 (33.0) 140 (50.7) 26 ( 9.4) 6 ( 2.2)	2.71 ± 0.79	1–5
	Perception of importance of PSM (score)	1.0–2.0 2.1–3.0 3.1–4.0 4.1–5.0		2 ( 0.7) 87 (31.1) 188 (67.1) 3 ( 1.1)	3.18 ± 0.44	1.57–4.48	
		Practice of PSM (score)		1.0–2.0 2.1–3.0 3.1–4.0 4.1–5.0	1 ( 0.4) 40 (14.2) 197 (70.4) 42 (15.0)	3.56 ± 0.54	1.76–4.81

Note. PSM = patient safety management.

<sup>a</sup> Missing responses excluded.

<sup>b</sup> Categories of hospital office worker, pharmacist, and nutritionist.

importance of PSM was significantly and negatively correlated with weekly working hours ( $r = -.39, p < .001$ ).

The practice of PSM showed a statistically significant positive correlation with perceived adequacy of PSM system construction ( $r = .40, p < .001$ ), education on PSM ( $r = .32, p < .001$ ), perceived adequacy of workload ( $r = .25, p < .001$ ), whether PSM guidelines were maintained in the workplace ( $r = .23, p < .001$ ), whether the employee was in contact with patients while on duty ( $r = .19, p = .001$ ), experience in reporting on PSM ( $r = .16, p = .009$ ), and perceived job satisfaction ( $r = .13, p = .032$ ). On the other hand, practice of PSM was found to be significantly and negatively correlated with weekly working hours ( $r = -.32, p < .001$ ; Table 3).

#### Factors affecting perception of the importance and practice of PSM

Multiple regression analysis was performed to identify factors affecting employees' perceptions of the importance and practice of PSM. Multicollinearity, residuals, and outlying values were examined in order to test regression analysis hypotheses regarding

variable independence. First, correlation coefficients between variables ranged from  $-.52$  to  $.41$ . Thus, no explanatory variable with a correlation coefficient higher than  $.80$  was found. Predictors were confirmed to be independent from one another. Moreover, there was no autocorrelation problem because the Durbin-Watson statistic was 1.857. In addition, tolerance ranged from  $.81$  to  $.96$  ( $>.10$ ) and the variance inflation factor ranged from 1.10 to 1.24 ( $\leq 10$ ). Thus, there was no problem with multicollinearity. The results of testing hypotheses on residuals satisfied the hypotheses of linearity, residual normality, and homoscedasticity. Cook's distance for examining outlying values did not exceed 1.0. Accordingly, all hypotheses of the regression equation were satisfied. Thus, results of the regression analysis were considered reliable.

For perception of the importance of PSM, the statistically significant predictors were whether the employee was in contact with patients while on duty ( $p < .001$ ), weekly working hours ( $p < .001$ ), experience of education on PSM ( $p < .001$ ), and perceived adequacy of the PSM system construction ( $p < .001$ ). These variables had an explanatory power of 38.2% ( $F = 40.26, p < .001$ ). For the practice

**Table 2** Differences Between Perception of the Importance and Practice of PSM (N = 280)

Characteristics		Categories	Perception of importance of PSM			Practice of PSM			
			M ± SD	t/F	p	M ± SD	t/F	p	
Demographic	Gender	Male	3.17 ± 0.39	0.14	.712	3.48 ± 0.51	2.75	.098	
		Female	3.19 ± 0.46			3.59 ± 0.55			
	Education	≤High school	3.26 ± 0.39	0.97	.380	3.63 ± 0.47	0.56	.573	
		College	3.16 ± 0.48			3.53 ± 0.53			
		≥Master	3.21 ± 0.44			3.60 ± 0.64			
Work-related	Hospital	A	3.14 ± 0.41	0.46	.633	3.53 ± 0.49	1.06	.350	
		B	3.20 ± 0.42			3.51 ± 0.51			
	Job	C	3.20 ± 0.48			3.62 ± 0.60			
		Nurse	3.41 ± 0.38	24.56	<.001	3.79 ± 0.43	20.91	<.001	
		Doctor	2.81 ± 0.42			3.09 ± 0.56			
		Nursing assistant	3.23 ± 0.33			3.64 ± 0.46			
		Medical technician	3.37 ± 0.25			3.77 ± 0.33			
		Others <sup>a</sup>	3.03 ± 0.47			3.42 ± 0.56			
		Whether in contact with patients while on duty	Yes	3.21 ± 0.41	12.25	.001	3.59 ± 0.52	10.46	.001
			No	2.89 ± 0.59			3.22 ± 0.67		
		Perceived adequacy of work load	Very high	3.10 ± 0.37	6.64	<.001	3.27 ± 0.67	8.01	<.001
			High	3.30 ± 0.37			3.72 ± 0.38		
Average	3.29 ± 0.33				3.71 ± 0.44				
Low	3.02 ± 0.50				3.36 ± 0.59				
Perceived job satisfaction	Very low	3.04 ± 0.52			3.35 ± 0.69				
	Very satisfied	3.21 ± 0.44	3.36	.010	3.55 ± 0.62	5.40	<.001		
	Satisfied	3.24 ± 0.42			3.70 ± 0.42				
	Average	3.17 ± 0.42			3.52 ± 0.56				
	Dissatisfied	2.94 ± 0.50			3.22 ± 0.59				
PSM-related	Education on PSM	Yes	3.32 ± 0.36	54.55	<.001	3.69 ± 0.45	30.24	<.001	
		No	2.96 ± 0.47			3.34 ± 0.60			
	Experience in reporting on PSM	Yes	3.32 ± 0.41	11.66	.001	3.68 ± 0.49	6.86	.009	
		No	3.12 ± 0.44			3.50 ± 0.55			
	Whether to maintain guidelines for PSM in workplace	Yes	3.26 ± 0.39	12.89	<.001	3.66 ± 0.45	14.71	<.001	
		No	3.07 ± 0.48			3.41 ± 0.62			
	Perceived adequacy of PSM system construction	Very high	3.60 ± 0.34	13.11	<.001	3.94 ± 0.51	13.79	<.001	
		High	3.32 ± 0.35			3.75 ± 0.46			
		Average	3.13 ± 0.41			3.51 ± 0.49			
		Low	2.88 ± 0.44			3.06 ± 0.58			
	Very low	2.63 ± 0.85			3.63 ± 0.79				

Note. PSM = patient safety management.

<sup>a</sup> Categories of hospital office worker, pharmacist, and nutritionist.

of PSM, statistically significant predictors were perceived adequacy of workload ( $p = .024$ ), perceived adequacy of PSM system construction ( $p = .001$ ), and perception of the importance of PSM ( $p < .001$ ). These variables had an explanatory power of 52.9% ( $F = 97.50$ ,  $p < .001$ ; Table 4).

## Discussion

Among our cohort, the mean perception of the importance of PSM was 3.2 out of 5, and their mean practice was 3.6 out of 5.

**Table 3** Relations Between Study Variables (N = 280)

Variables	Perception of importance of PSM ( $r/p$ )	Practice of PSM ( $r/p$ )
Age	.15 (.016)	.06 (.355)
Work experience	.16 (.008)	.06 (.287)
Weekly working hours	-.39 (<.001)	-.32 (<.001)
Whether in contact with patients while on duty <sup>a</sup>	.21 (.001)	.19 (.001)
Perceived adequacy of work load	.25 (<.001)	.25 (<.001)
Perceived job satisfaction	.10 (.101)	.13 (.032)
Education on PSM <sup>a</sup>	.41 (<.001)	.32 (<.001)
Experience in reporting on PSM <sup>a</sup>	.20 (.001)	.16 (.009)
Whether to maintain guidelines for PSM in workplace <sup>a</sup>	.21 (<.001)	.23 (<.001)
Perceived adequacy of PSM system construction	.40 (<.001)	.40 (<.001)

Note. PSM = patient safety management.

<sup>a</sup> Dummy variable (Yes = 1, No = 0).

Although comparisons are not straightforward because of differences in measuring instruments, these results are similar to that reported by Noh (2008), who measured general perceptions of patient safety in a hospital survey of patient safety culture (Agency for Healthcare Research and Quality, 2004) in Korea using doctors, nurses, public health workers and office workers.

Most of participants (91.4%), regardless of job type, replied that they were in contact with patients while on duty, and perception of the importance and practice of PSM were significantly higher for those in contact with patients. However, while most hospital employees were in contact with patients while on duty, only 60.5% received education on PSM and only 58.0% replied that PSM guidelines were maintained in the workplace. By job category, nurses showed the highest perception of the importance and practice of PSM, followed by medical technicians, nursing assistants, office workers/pharmacists/nutritionists, and doctors. Additional analysis on the educational experience of PSM by job category showed the highest percentage in nurses (80.6%) followed by nursing assistant (66%), medical technician (52.4%), others (49.4%) and doctors (28.3%). These results suggest that education on safety-related accidents and management, which has been limited to nursing staffs, should be expanded to all hospital employees, and that various education methods and materials should be developed to address the characteristics of different job types.

Perception of the importance and practice of PSM was also found to be significantly dependent on experience in reporting on PSM, whether the workplace maintained PSM guidelines, and the perceived adequacy of the PSM system construction. This finding

**Table 4** Predictors of Perception of the Importance and Practice of PSM (N = 280)

Variables		B	SE	$\beta$	t (p)	R <sup>2</sup>	Adjusted R <sup>2</sup>	F (p)
Perception of importance of PSM	Constant	2.60	0.12		21.65 (<.001)	.382	.372	40.03 (<.001)
	Whether in contact with patients while on duty <sup>a</sup>	0.28	0.08	.18	3.63 (<.001)			
	Weekly working hours	−0.01	0.00	−.33	−6.54 (<.001)			
	Education on PSM <sup>a</sup>	0.23	0.05	.26	4.87 (<.001)			
Practice of PSM	Perceived adequacy of PSM system construction	0.15	0.03	.25	4.79 (<.001)	.529	.524	97.50 (<.001)
	Constant	0.60	0.17		3.46 (.001)			
	Perceived adequacy of work load	0.05	0.02	.10	2.27 (.024)			
	Perceived adequacy of PSM system construction	0.11	0.03	.16	3.33 (.001)			
	Perception of importance of PSM	0.77	0.69	.62	13.03 (<.001)			

Note. PSM = Patient safety management.

<sup>a</sup> Dummy variable (Yes = 1, No = 0).

concur with those of previous reports (Choi, Lee, & Lee, 2010; Park, 2008), which found that nurses' scores for patient safety culture and safe nursing activity were higher for those that had received education on patient safety than those who had not and were proportional to the frequency of such education. These findings indicate that perception and practice of PSM can be improved by providing hospital employees with continuous and repeated education on patient safety. In addition, 70% of the participants in the present study did not have experience in reporting on PSM; 42% replied guidelines on PSM had not been maintained in their workplace. In particular, doctors had the lowest and a below average score on the perception of importance and practice of PSM, which is consistent with reports by Noh (2008) and Keum (2009). Bates and Gawande (2000) and Schectman and Plews-Ogan (2006) reported somewhat similar results. They found that physicians' barrier to safety reporting and practicing in a medical environment is negatively associated with perception of hospital safety. According to this finding, research and education are required to identify and resolve factors hindering doctors' perceptions of the practice of PSM. It suggests that all hospital employees should make joint efforts in providing patients with safe care and enhancing patient satisfaction with medical services. Furthermore, research needs to determine whether the lowest score of perception and practice of PSM in doctors was due to the lack of experience of an accident or due to a failure to issue a report.

Regarding the result of the relationship analysis, weekly working hours showed a significant negative relationship between perception of importance and practice of PSM. This finding is consistent with that of a previous study on nurses (Park, 2008), and may be explained by increased fatigue and reduced attentiveness, which ultimately have negative effects on PSM (Lee & Jung, 2007). Moreover, work experience was found to be only positively related to the perception of importance of PSM, but not with the practice of PSM. This may be the result of an educational program that enforces the knowledge and principle of the PSM for the new employees. It suggests that enhancement programs on the perception and practice of PSM is necessary for new employees and education on PSM should be continuously provided for current employees. In addition, building strict guidelines and strong systems to report on PSM should be encouraged in the workplace. A tailored PSM education program giving consideration to the job categories or workplace characteristics will be more effective. Through these efforts, perception of the importance and practice of PSM by hospital employee would be enhanced.

The results of the regression analysis conducted to identify factors affecting the perceptions of employees regarding the importance of PSM showed that whether the employee was in contact with patients while on duty, weekly working hours, education on PSM, and perceived adequacy of the PSM system construction were statistically significant predictors. In particular, our findings regarding the significances of weekly working hours and

education on PSM are consistent with those of Park (2008). With respect to the practice of PSM, the significant predictors identified were perceived adequacy of workload, perceived adequacy of PSM system construction, and perception of the importance of PSM. These results may be useful for the design of PSM processes and for developing strategies that promote employees' PSM practices. In particular, an adequate workload, building a systematic PSM protocol, and increasing the perception of PSM should be adopted as strategic targets.

Finally, interest in PSM and its importance among healthcare workers has increased as a result of the introduction of various types of healthcare accreditation in Korea. However, this process is in its infancy. We suggest that the predictors found to affect perception of the importance and practice of PSM in this study be used as basic materials for future research and be incorporated into promotion programs on PSM.

#### Limitations

The measuring tools used in this study were composed by our research team even though they were tested for reliability and validity prior to data collection. Thus, our ability to perform comparative analysis with the results of other studies was restricted by the inter-study differences. Proportion of the occupations were not equally represented (the nursing profession was well represented), and all employees were included without considering their length of stay at current job (newly hired employees were included). Thus, care should be taken when applying our results. We suggest an additional study be conducted on a cohort that well represents all occupational groups and takes into account length of stay at current job.

#### Conclusion

This study was conducted in order to survey hospital employees' perceptions of the importance and practice of PSM and to identify its influencing factors. The statistically significant predictors for perception of the importance of PSM were whether hospital employees were in contact with patients while on duty, weekly working hours, education on PSM, and perceived adequacy of PSM system construction. The significant predictors for the practice of PSM were perceived adequacy of work load, perceived adequacy of PSM system construction and perception of importance of PSM. The importance of the perception or practice of PSM has been emphasized restrictively to nursing staff. This results suggest that various education methods and intervention programs should be developed to improve perception of the importance and practice of PSM among hospital employees.

#### Conflict of interest

The authors have no potential conflict of interest to declare.

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