



Research Article

Patient Participation in Patient Safety and Its Relationships with Nurses' Patient-Centered Care Competency, Teamwork, and Safety Climate



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ABSTRACT

Purpose: This study's aim was to examine degrees of patient participation in patient safety activities in hospitals and to investigate their relationships with nurses' patient-centered care competency (PCC), teamwork, and safety climate.

Methods: A cross-sectional study design was used. Data were collected with 479 nurses from two general hospitals in Seoul, Korea, using a questionnaire designed to collect data on patient participation in patient safety activities, PCC, teamwork perceptions, and safety climate. The response rate was 74.1% ($N = 355$). Data were analyzed using descriptive statistics and multiple logistic regression analysis.

Results: The mean score for patient participation was 2.76 ± 0.46 of 4.0. The mean scores for PCC, teamwork, and safety climate were 3.61 ± 0.46 , 3.64 ± 0.41 , and 3.35 ± 0.57 of 5.0, respectively. Nurses who experienced high patient participation in patient safety activities (≥ 3.0) had higher scores for PCC, teamwork, and safety climate. Multiple logistic regression analysis revealed that PCC (OR = 2.31, 95% CI = 1.14–4.70) and safety climate (OR = 2.51, 95% CI = 1.09–5.78) scores were the significant factors associated with patient participation.

Conclusion: The degree of patient participation in patient safety activities was not high. Nurses' PCC, teamwork, and safety climate were positively related with patient participation. In particular, the findings indicate that enhancing nurses' competency for patient-centered care and creating a strong safety climate are important to promote patient participation for safer health care.

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Introduction

Along with reports about the positive impacts of patient participation in patient safety activities on health care, such as safe medication management [1] and fewer adverse events [2], patient participation in safety has been promoted internationally by the World Health Organization and other health care institutions [3], including the Agency for Healthcare Research and Quality's 20 tips

to prevent medical errors and the Joint Commission Speak Up program. Patient participation in health care is also suggested as a core element of patient-centered care [4]. The Patient Safety Act of 2015 enacted in Korea states that participation in patient safety activities is each patient's right and responsibility. Patient participation in nursing practice involves relationships between health care professionals and patients characterized by power and control sharing by health care professionals, shared health-related information, and engagement in physical activities and clinical communication [5]. However, studies have indicated that patient participation in clinical practice is not easily achieved [6,7].

Previous research has shown that patients are generally willing to participate in safety activities [8–11]; however, the degree of patients' willingness to participate or actual participation in such activities varies depending on the activity [8–10,12]. For instance, although informing care providers about drugs and asking about

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the purpose of medications were performed frequently, participation in activities of asking whether care providers wash their hands were less frequent [8,12]. In particular, as nurses are frontline care providers, exploring their views of participation behaviors helps understand the current state of patient participation in practice. In this light, several studies have been conducted [6,13–15]. Studies found that adherent types of participation activities were most common [6]. However, most were conducted in western countries and explored patient participation by focusing on nursing care rather than patient safety. Furthermore, because the importance of patient participation in safety can vary depending on the context of care delivery, the need for empirical studies on patient participation in relation to patient safety activities is suggested [3,16].

Patient participation is affected by health care professionals' knowledge, skills, and attitudes toward patient participation and the care environment [16–18]. For instance, encouragement from health care professionals, including nurses, was found to facilitate patient participation [11]. Nurses' competency in patient-centered care is recognized as an important factor affecting patient participation [7,13–15]. In addition, the organization of the work surrounding patient care and its context were found to be parameters affecting patient participation in practice [13,14], and in particular, a lack of teamwork and interprofessional collaboration hindered patient participation [15]. Cultural factors such as the hierarchical, paternalistic culture of health care professions were suggested as barriers to patient participation in safety [16,18]. Furthermore, busy settings, where clinicians experienced work-related time constraints and patient safety was not a priority, were a barrier to patient participation [18]. Thus, nurses working in care environments with a strong safety ethos may take the initiative to involve patients more in safety practices. However, despite the crucial role of nurses in promoting patient participation [6] and the importance of the environment where nurses work, there is a lack of empirical research on the relationships of nurses' patient-centered care competency (PCC), teamwork, and safety climate with patient participation.

Therefore, the objective of this study was to examine patient participation activities related to patient safety and their importance in clinical practice from the nurses' perspective. Furthermore, we investigated whether patient participation is associated with nurses' PCC, teamwork, and safety climate. In this research, authors used the categorical framework regarding factors influencing patient participation in safety [17]. The framework included five categories: health care professional, care setting, patient, illness, and task-related factors. In this study, excluding patient and illness-related factors, we focused on health care professional-related and setting-related factors. The former includes health care professionals' knowledge, skills, and behaviors about patient participation in safety, and the latter includes "primary/secondary/tertiary" and "inpatient/outpatient" as the characteristics of health care settings [17]. The task-related factor, which refers to specific patient behaviors required for involvement in safety [17], was included as part of patient participation activities based on methods through which patients can contribute to patient safety: "informing health and management plans," "monitoring and ensuring safe delivery of care," and "improving systems improvement" [19]. The findings will contribute to the development of effective strategies to promote patient participation to improve patient-centered care and patient safety.

Methods

Study design

A cross-sectional study design was used. This study was part of a multiyear (2014–2016) project on patient-centered care and

patient experiences of patient safety and quality care. The research project consisted of independent quantitative and qualitative studies including a patient survey, a nurse survey, individual patient interviews, and focus group discussions with practicing nurses. Related articles have been published elsewhere [20,21].

Participants and setting

Participants were nurses in acute-care general hospitals. A *priori* sample size estimate of 455 was calculated based on the recommendation of at least 10 cases per item for factor analysis [22] and the response rate in previous studies [23]. The sampled population consisted of nurses in two teaching hospitals located in Seoul, Korea. At the time of this study, hospital A, a tertiary general hospital, had 850 beds, and hospital B, a general hospital, had 736 beds. The total numbers of nurses in their nursing departments were 721 and 496, respectively. After discussions with the nursing departments of the hospitals, adult care units were sampled and then, to avoid sampling bias, all nurses working at the care units were invited to participate. Thus, we invited 479 nurses (291 and 188 for each hospital). After deleting incomplete data, the final data set for this study consisted of questionnaire data from 355 nurses. The response rate was 74.1%. This sample size was sufficient based on the recommendation of 10 to 20 cases per predictor to achieve stable parameter estimates in multiple logistic regression [22].

Measures

The set of patient participation activities was selected from the relevant literature [8–12] and from such recommendations as the Agency for Healthcare Research and Quality's 20 tips to prevent medical errors and the Joint Commission Speak Up program. After a group consisting of eight nurse managers and five domain experts in quality improvement and patient safety confirmed the validity of each activity on a five-point scale (1 = "not very relevant," 5 = "very relevant"), seventeen items with a score of 4.0 or higher were retained. In addition, because patient participation in safe care management by self at home was one of the ways that patients can contribute to patient safety [19], authors added three items from the set of patient participation activities for this study (i.e., asking questions about how to take medicines at home, asking health care staff to explain care plans at home, and asking questions about foods, drinks, or activities to be avoided). Thus, the final items for this study consisted of 20 participation activities. Cronbach's α coefficient was .91.

Participants were asked to indicate how frequently they experienced each participation activity in practice using a 4-point scale (1 = "not at all," 2 = "sometimes," 3 = "often," 4 = "always"). A summary variable for the degree of patient participation was created by averaging the scores of all the items. Higher scores indicated more frequent activities. In addition, nurses were asked to rate the importance of each item using a 5-point Likert scale (1 = "not very important," 5 = "very important").

Nurses' competency for patient-centered care was measured using the PCC scale [24], which consists of 17 items with four subscales: "respecting patients' perspectives," "promoting patient involvement in care processes," "providing for patient comfort," and "advocating for patients." This scale has been validated with Korean hospital nurses [24]. Confirmatory factor analysis revealed that the four-factor model showed acceptable fit to the data (comparative fit index = .95, root mean square error of approximation = .07, and standardized root mean square residual = .05) [25]. The Cronbach's α coefficient was .93 for the entire scale and .89, .88, .81, and .81 for the subscales, respectively.

Teamwork was measured using the 35-item Teamwork Perceptions Questionnaire (TPQ) [26]. It consists of five subscales: “team structure,” “leadership,” “situation monitoring,” “mutual support,” and “communication.” This tool has been validated in Korean hospitals [26]. The five-factor model was acceptable (comparative fit index = .85, root mean square error of approximation = .07, and standardized root mean square residual = .06) [25,27]. The Cronbach's α coefficient was .95 for the entire scale and .83, .91, .86, .83, and .85 for the subscales, respectively.

Safety climate was measured using a subscale of the Safety Attitude Questionnaire [28]. This subscale consists of seven items and has been validated in Korean hospitals [29]. The Cronbach's α coefficient was .83.

Nurses were asked to answer the degree of agreement with each statement of the PCC scale, TPQ, and safety climate scale on a five-point Likert scale (1 = “strongly disagree,” 5 = “strongly agree”). A higher score indicates a higher PCC, better teamwork, or more positive safety climate. Other information on nurses' general characteristics, such as age, gender, educational level, and workplace, was also collected.

Data collection

Questionnaires were distributed with envelopes to 479 nurses through the nursing department in each hospital in December 2015. Nurses agreeing to participate in this study received a questionnaire. After completion, the questionnaires were sent in sealed envelopes to the nursing departments and then returned to our research team. Authors provided each respondent a gift worth USD 5 for participation.

Data analysis

Data were analyzed using the SAS program version 9.4 (SAS Institute, Cary, NC, USA). Participants' general characteristics, degrees of patient participation, importance ratings, and scores for PCC, TPQ, and safety climate scales were summarized using descriptive statistics. The validity of the scales was confirmed using confirmatory factor analysis. The internal consistencies were examined using Cronbach's α coefficients. The degrees of patient

participation were dichotomized into “high participation” (≥ 3.0) and “low participation” (< 3.0). This study set the cutoff value at 3.0 because mean scores of 3.0 or higher indicated that patients had performed overall participation activities “often” or more frequently. The “often” and “always” are considered as positive responses regarding patient participation [2]. Safety climate scores of 3.0 or higher were defined as a “positive” safety climate.

Chi-square tests were used to identify differences in degrees of patient participation by participants' general characteristics, and *t*-tests were used to identify differences in scores for PCC, TPQ, and safety climate between nurses with experiences of high or of low participation. Pearson correlation coefficients were calculated between the PCC, TPQ, and safety climate scores. Multiple logistic regression analyses were performed to determine the relationships of patient participation with nurses' PCC, teamwork, and safety climate at the entire scale (model 1) and subscale (model 2) levels. As covariates in both models, we included other nurse-related and care setting-related characteristics based on the categorical framework on factors affecting patient participation [17]. We examined the multicollinearity among independent variables in the models using the variance inflation factor [30]. The results (variance inflation factors = 1.02–3.71 and 1.07–3.76 for models 1 and 2, respectively) showed that there was no multicollinearity. Overall fit of the models was examined using Hosmer-Lemeshow goodness-of-fit tests. The statistical significance level was set at $p < .05$.

Ethical considerations

This study protocol was approved by the institutional review board of Kyung Hee Medical Center (Approval no. KMC IRB 1516-02). Data confidentiality and the anonymity of respondents were ensured. Written informed consent was obtained from all the participants.

Results

Participants' general characteristics

The general characteristics of the participants are given in Table 1. Of the 355 participants, 98.6% were women and their mean

Table 1 Participants' General Characteristics and Patient Participation Level (N = 355).

Variable	Category	Total		Patient participation				χ^2	p
		n	%	High (n = 105)		Low (n = 250)			
				n	%	n	%		
Gender	Man	5	1.4	1	1.0	4	1.6	0.22	.637
	Woman	350	98.6	104	99.0	246	98.4		
Age (yrs)	22–29	165	46.5	43	40.9	122	48.8	7.29	.026
	30–39	114	32.1	30	28.6	84	33.6		
	40–59	76	21.4	32	30.5	44	17.6		
Educational level	3-year college	61	17.2	22	20.9	39	15.6	2.11	.348
	4-year university	198	55.8	53	50.5	145	58.0		
	Graduate school or higher	96	27.0	30	28.6	66	26.4		
Years in nursing	5 or less	129	36.3	32	30.5	97	38.8	5.09	.079
	6–10	72	20.3	18	17.1	54	21.6		
	11 or more	144	40.6	52	49.5	92	36.8		
Job position	Missing	10	2.8	3	2.9	7	2.8	6.11	.047
	Staff nurse	311	87.6	85	80.9	226	90.4		
	Charge nurse	28	7.9	13	12.4	15	6.0		
Hospital type	Head nurse	16	4.5	7	6.7	9	3.6	3.53	.060
	A	216	60.9	56	53.3	160	64.0		
Workplace	B	139	39.1	49	46.7	90	36.0	3.66	.301
	General care unit	172	48.5	53	50.5	119	47.6		
	Intensive care unit	71	20.0	17	16.2	54	21.6		
	Outpatient department	69	19.4	18	17.1	51	20.4		
	Others	43	12.1	17	16.2	26	10.4		

age was 33.41 (SD 8.62) years; 198 (55.8%) had bachelor degrees, 96 (27.0%) had master degrees or higher, and 61 (17.0%) had diplomas. Participants ($n = 345$) had a mean of 10.63 (SD 8.65) years in nursing. Most ($n = 311$, 87.6%) were staff nurses and the others were in managerial positions. Of the participants, 216 (60.9%) worked at hospital A, the rest at hospital B. Almost half ($n = 172$, 48.5%) worked at general care units, 71 (20.0%) at intensive care units, and 69 (19.4%) at outpatient departments.

The degree of patient participation and the ratings of the importance

The mean score for patient participation was 2.76 ± 0.46 . Among the participants, 105 (29.6%) reported experiences of high patient participation. There were significant differences in patient participation by nurses' age and job position (Table 1). At the item level, the most frequently performed participation activity was "informing health care staff of medical history" (3.42 ± 0.63), with a positive response rate of 93.2%. The least frequent participation activity was "asking health care staff whether they washed their hands" (1.91 ± 0.97), with a positive response rate of 25.4% (Table 2).

The mean score for the importance of the participation activities was 4.23 ± 0.54 . The item with the highest importance score was "informing health care staff of medical history" (4.63 ± 0.64). "Using a list of questions related to health and management plans at medical encounters" had the lowest score (3.65 ± 0.77).

Nurses' PCC, teamwork, and safety climate

The overall PCC score had a mean of 3.61 (SD 0.46). Among subscales, "providing for patient comfort" was highest (3.82 ± 0.53)

and "promoting patient involvement" was lowest (3.38 ± 0.58). The mean TPQ score was 3.64 ± 0.41 . The mean scores for each subscale were 3.65 ± 0.49 for "team structure," 3.53 ± 0.64 for "leadership," 3.70 ± 0.45 for "situation monitoring," 3.67 ± 0.48 for "mutual support," and 3.66 ± 0.48 for "communication." The mean score for safety climate was 3.35 ± 0.57 . Of the participants, 273 (76.9%) responded that they worked in a positive safety climate (Table 3).

Relationships of patient participation with nurses' PCC, teamwork, and safety climate

There were significant differences in the scores for the PCC, TPQ, and safety climate by degree of patient participation at the entire and subscale levels, except for the "team leadership" subscale (Table 3). Specifically, nurses who reported high patient participation had higher scores for PCC, TPQ, and safety climate. There were significant correlations between PCC, TPQ, and safety climate scores (Pearson's $r = .46$ to $.70$). The subscale correlation coefficients ranged from .19 to .69.

Multiple logistic regression analyses were performed with the independent variables of PCC, TPQ, and safety climate at the entire scale (model 1) and subscale (model 2) levels, controlling for other nurse and care-setting variables of gender, age, educational level, job position, workplace, and hospital type (Table 4). We included the categorical variable for safety climate due to the high correlation between safety climate and teamwork ($r = .70$). In addition, because there was a high correlation between nurses' age and years in nursing (Pearson's $r = .97$), and there were missing cases in the responses to years of nursing ($n = 10$), we included only the age variable in the models. Model 1 revealed that PCC and safety climate were the significant factors associated with patient

Table 2 Experience of and Importance Ratings of Patient Participation Activities ($N = 355$).

Patient participation activities	n (%) ^a	Experience ^b	Importance ^c
		Mean \pm SD	Mean \pm SD
Informing health care staff of medical history	331 (93.2)	3.42 \pm 0.63	4.63 \pm 0.64
Informing about any allergies or adverse reactions to medications	288 (81.1)	3.21 \pm 0.75	4.61 \pm 0.69
Informing about all medications used	314 (88.5)	3.29 \pm 0.66	4.51 \pm 0.69
Informing about symptoms that deteriorated after treatment	279 (78.6)	3.10 \pm 0.73	4.48 \pm 0.67
Following medical instructions	291 (82.0)	2.99 \pm 0.60	4.46 \pm 0.69
Informing when patients are worried a wound is infected	229 (64.5)	2.81 \pm 0.82	4.43 \pm 0.68
Collaborating when health care staff confirm patient identification	269 (75.8)	3.01 \pm 0.78	4.39 \pm 0.73
Asking questions when patients do not understand medical instructions	292 (82.3)	3.08 \pm 0.67	4.39 \pm 0.66
Informing health care staff of errors if patients think an error has occurred	205 (57.8)	2.73 \pm 0.79	4.38 \pm 0.67
Asking questions about how to take medicines at home and their side effects	215 (60.6)	2.77 \pm 0.77	4.31 \pm 0.71
Asking health care staff to explain care plans that patients need to follow at home	218 (61.4)	2.75 \pm 0.78	4.28 \pm 0.70
Asking about medical diagnosis	231 (65.1)	2.83 \pm 0.77	4.26 \pm 0.75
Asking questions about whether prescribed medications are taken along with other medicines	208 (58.6)	2.70 \pm 0.74	4.20 \pm 0.71
Asking about the purposes of medications	227 (63.9)	2.79 \pm 0.70	4.19 \pm 0.68
Reporting medical errors to a hospital incident reporting system	150 (42.3)	2.43 \pm 0.89	4.17 \pm 0.82
Asking questions about the signs/symptoms of abnormal healing	195 (54.9)	2.60 \pm 0.79	4.13 \pm 0.76
Informing when one's hospital identification bracelet is lost	131 (36.9)	2.31 \pm 0.86	4.12 \pm 0.83
Asking questions about what foods, drinks, or activities need to be avoided	156 (43.9)	2.45 \pm 0.79	4.11 \pm 0.73
Asking health care staff whether they washed their hands	90 (25.4)	1.91 \pm 0.97	4.07 \pm 0.86
Using a list of questions on health management at medical encounters	78 (22.0)	2.09 \pm 0.78	3.65 \pm 0.77

Note. SD = standard deviation.

^a The number and proportion of the participants with positive responses ("often" and "always").

^b 4-point scale (1 = "not at all", 2 = "sometimes", 3 = "often", 4 = "always").

^c 5-point Likert scale (1 = "not very important", 5 = "very important").

Table 3 Nurses' Patient-Centered Care Competency, Teamwork, and Safety Climate Scores by Patient Participation Level (N = 355).

Variable	Total Mean ± SD	Patient participation		t	p
		High Mean ± SD	Low Mean ± SD		
Overall PCC score	3.61 ± 0.46	3.76 ± 0.46	3.55 ± 0.45	−3.99	<.001
Respecting for patients' perspectives	3.64 ± 0.50	3.82 ± 0.49	3.57 ± 0.49	−4.32	<.001
Promoting patient involvement in care	3.38 ± 0.58	3.52 ± 0.57	3.32 ± 0.58	−2.97	.003
Providing for patient comfort	3.82 ± 0.53	3.93 ± 0.55	3.78 ± 0.52	−2.52	.012
Advocating for patients	3.73 ± 0.55	3.87 ± 0.56	3.67 ± 0.54	−3.22	.001
TPQ score	3.64 ± 0.41	3.74 ± 0.43	3.60 ± 0.39	−2.96	.003
Team structure	3.65 ± 0.49	3.74 ± 0.50	3.62 ± 0.48	−2.23	.026
Team leadership	3.53 ± 0.64	3.63 ± 0.67	3.49 ± 0.62	−1.94	.053
Situation monitoring	3.70 ± 0.45	3.78 ± 0.46	3.67 ± 0.45	−2.05	.041
Mutual support	3.67 ± 0.48	3.77 ± 0.53	3.63 ± 0.45	−2.23	.027
Team communication	3.66 ± 0.48	3.79 ± 0.50	3.60 ± 0.46	−3.35	.001
Safety climate score	3.35 ± 0.57	3.53 ± 0.48	3.27 ± 0.59	−4.44	<.001
	n (%)	n (%)	n (%)	χ^2	p
Positive	273 (76.9)	95 (26.8)	178 (50.1)	15.47	<.001
Negative	82 (23.1)	10 (2.8)	72 (20.3)		

Note. PCC = patient-centered care competency; SD = standard deviation; TPQ = Teamwork Perceptions Questionnaire.

participation. Specifically, nurses with higher PCC scores were more likely to experience high patient participation (OR = 2.31; 95% CI = 1.14–4.70). Those who worked in a positive safety climate were more likely to experience high patient participation (OR = 2.51; 95% CI = 1.09–5.78). Model 2 showed that the “respecting patients' perspectives” component of the PCC and safety climate were significantly related to patient participation. Specifically, nurses with higher scores for the “respecting patients' perspectives” subscale (OR = 2.18; 95% CI = 1.01–4.70) and in positive safety climate (OR = 2.61; 95% CI = 1.10–6.20) were more likely to experience high patient participation.

Discussion

Patient participation in health care is a promising strategy to improve patient safety and ensure patient-centered health care [3]. To the best of our knowledge, this is the first study to examine degrees of patient participation in patient safety activities in Korean hospitals from the health care providers' viewpoint. This study

focused on nurses' competency for patient-centered care, teamwork, and safety climate as the characteristics of care providers and the care environment affecting patient participation. This study found that the degree of patient participation in clinical practice was not high. Nurses' PCC, teamwork, and safety climate were positively associated with patient participation. When considering these characteristics together, nurses' PCC and safety climate were the significant factors associated with patient participation. This finding indicates the importance of nurses' competency in patient-centered care and a care environment prioritizing patient safety in promoting patient participation in hospital practice.

The degree of patient participation was not high, considering that these activities are commonly recommended for patient safety and need to be performed frequently. Overall, responsive, less-challenging activities were relatively frequent, which is consistent with previous findings that patients were less willing to participate in challenging behaviors [11]. Specifically, “asking about health care staff's handwashing” was the least frequent activity, consistent with the findings of the studies with patients [8,12]. This activity has been considered as a challenging one [9–11], possibly because “asking about health care providers' handwashing” may indicate confronting and interrogating health care professionals' competencies [9,11]. In relation, studies have shown that patients were least inclined toward asking about health care professionals' compliance to handwashing, and many patients felt uncomfortable in participating in this activity [8,9]. Frequent participation activities were associated with informing and sharing health and management plans [19]. The actions of asking about “treatment/care plans,” “medical diagnosis,” or “the purposes of medications” were less frequent than in the findings of previous studies with patients (75.2% to 85.1%) [8]. This may be due to the differences in the study subjects. In addition, this finding might reflect that many patients prefer a passive participation in health care encounters and are accustomed to complying with medical instructions and responding to health care professionals' questions. Therefore, because the activities in this study were rated as important for ensuring patient safety, nurses need to encourage and help patients to participate in these activities. Promoting less-frequent activities would have greater priority. On the other hand, all patients cannot always participate in these activities. Demented or unconscious patients could not participate in such activities. For instance, health care providers, including nurses, can notify patients that they washed their hands before they ask. The primary responsibility for

Table 4 Multiple Logistic Regression Analysis Results for Patient Participation.

Variable	Model 1 ^a	Model 2 ^b
	OR (95% CI)	OR (95% CI)
Overall PCC	2.31 (1.14–4.70)	
Respecting for patients' perspectives		2.18 (1.01–4.70)
Promoting patient involvement in care		0.78 (0.40–1.54)
Providing for patient comfort		1.09 (0.55–2.14)
Advocating for patients		1.41 (0.70–2.80)
TPQ	1.03 (0.46–2.30)	
Team structure		0.76 (0.34–1.69)
Team leadership		1.22 (0.72–2.05)
Situation monitoring		0.64 (0.25–1.60)
Mutual support		1.14 (0.53–2.45)
Team communication		1.43 (0.63–3.24)
Positive safety climate	2.51 (1.09–5.78)	2.61 (1.10–6.20)

Note. CI = confidence interval; OR = odds ratio; PCC = patient-centered care competency; TPQ = Teamwork Perceptions Questionnaire.

^a Multiple logistic regression model at the entire scale level, after adjusting for gender, age, educational level, job position, workplace, and hospital type (Hosmer-Lemeshow goodness-of-fit test: $p = .213$).

^b Multiple logistic regression model at the subscale level, after adjusting for gender, age, educational level, job position, workplace, and hospital type (Hosmer-Lemeshow goodness-of-fit test: $p = .184$).

patient safety in clinical practice rests on health care professionals. However, patients need to be invited to act as a “safety buffer” [17]. Depending on the patient's conditions, their family members or other caregivers may need to be involved in these patient safety activities.

Nurses' PCC has been stressed for high quality care. Nurses with a higher competency for patient-centered care experienced patient participation more frequently in practice. This finding supports the promotion of patient participation for patient-centered care provision [4] and indicates the importance of nurses' competency toward patient participation. This finding is consistent with previous reports [13–15]. However, nurses' competency in promoting patients' involvement in care was rated lowest. This finding can be attributed to the fact that nurses do not have enough time to promote patient participation in care owing to busy work situations. Another explanation could be that nurses may lack the awareness of the importance of involving patients as care partners. Therefore, supporting and enhancing nurses' competency in assessing barriers to patient participation, providing access to resources, empowering patients, and involving and partnering with patients is needed. In particular, among the PCC subscales, nurses' competency for respecting patients' perspectives was significantly associated with patient participation. Identifying and understanding patients' values, preferences, and needs, communicating these with other care providers, and integrating these into nursing care will facilitate patient participation in health care. Therefore, nurses' competency for patient-centered care needs to be enhanced to promote patient participation in safety.

Nurses working better and more effectively in teams experienced patient participation in care more frequently. Patients are members of the health care team with important roles for effective treatment and care. Therefore, nurses working effectively in teams might encourage patients to participate in care processes. In particular, enhanced communication within health care teams can provide more opportunities for dialogs between health care providers and patients, helping promote patients' participation in care.

Interestingly, safety climate was the most influential factor affecting patient participation when the variables of interest were considered together. This finding indicates that care environments that put priority on patient safety are important in patient participation. Nurses working in a strong safety climate would prioritize and value patient safety, rather than efficiency or productivity, to prevent and reduce medical errors and possible adverse events. Thus, nurses may better involve patients in ensuring patient safety, as by informing them about medications, allergies, and abnormal signs and symptoms. They might encourage patients to ask questions and perform teach-back to confirm their understanding. Therefore, strengthening the safety climate can be an important strategy to facilitate active patient participation.

In addition, the logistic regression model at the subscale level (model 2) showed insignificant, but negative relationships between some components of the scales and patient participation. Correlations among the components might affect this result. However, the analysis demonstrated that there was no multicollinearity.

Meanwhile, this study had several limitations. First, this study involved nurses in only two teaching hospitals. Therefore, the generalizability of the findings is limited. Furthermore, authors did not compare the characteristics between the participating and nonparticipating nurses in this study. Thus, authors could not conclude whether the participants' characteristics were representative of nonparticipants, which also limits the generalizability of the findings to the research population. Second, because patient participation was measured by nurses' self-reported experience, recall bias is possible. Furthermore, patient participation was not measured directly. However, nurses as major frontline caregivers

can provide important insights on patient participation [6]. Third, authors did not include patient and illness factors in this study. Such characteristics as patients' gender, age, education, health literacy, and disease severity can affect their ability to participate [17]. Thus, authors recommend future studies of patient participation with health care professionals in different care settings. Furthermore, patient participation needs to be directly measured with patients using various methodologies such as observation and interviews. Authors also recommend studies including patient and illness-related characteristics to gain a better understanding of factors affecting patient participation. In addition, interventional studies to enhance patient participation in clinical practice (e.g., patient safety campaign using audiovisual educational materials) are suggested.

Conclusion

Overall, this study demonstrated that nurses' perceived degrees of patient participation in hospitals were not high and varied depending on the activities. Although nurses' competencies for patient-centered care, teamwork, and safety climate were associated with patient participation, nurses' competency for patient-centered care, especially for the “respecting patients' perspectives” component, and safety climate were more influential factors in promoting patient participation in health care. Patient-centered care encourages shared decision-making with patients about health care management, while viewing a patient as a whole person. Nurses with high competency for patient-centered care will encourage patient participation in safety by building partnerships with patients. Safety climate refers to a care environment where patient safety is embedded in hospital policies, regulations, and practices. In such an environment, nurses are more involved in safe practices and more likely to involve patients in ensuring and improving their safety through patient identification, teach-back, checklist use, and hand hygiene [3]. A strong safety climate will facilitate synergy between patient participation and safe practices. Therefore, building nurses' competency for patient-centered care needs to be highlighted in nursing education. Hospital executives and nurse managers should strengthen safety culture in clinical practice to promote patient-centered patient participation and patient safety.

Conflicts of interest

The authors declare no conflict of interest.

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