

The influencing factors of pediatric nurses' perception of patient safety culture and partnership with patients' parents on patient safety nursing activities in South Korea: a descriptive study

Seo Jin Lee¹, Young Ran Han²

¹PhD Student, College of Nursing, Dongguk University WISE, Gyeongju, Korea

²Professor, College of Nursing, Dongguk University WISE, Gyeongju, Korea

Corresponding author

Young Ran Han

College of Nursing, Dongguk University
WISE, 87 Dongdae-ro, Gyeongju 38067,
Korea

TEL: +82-054-770-2625

FAX: +82-054-770-2618

E-MAIL: hanyr@dongguk.ac.kr

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Purpose: This study aimed to identify the effects of pediatric nurses' perception of patient safety culture and their partnership with patients' parents on pediatric patient safety nursing activities. **Methods:** This descriptive study was conducted over a two-month period, from October to November 2022, utilizing self-reported questionnaires. The study included 165 nurses, each having at least 6 months of working experience in wards where children were admitted. These nurses were selected from 13 pediatric specialty hospitals, general hospitals, and university hospitals across seven regions. The data analysis was performed using the SPSS/WIN 26.0 program (IBM Corp.) for descriptive statistics, t-test, One-way ANOVA, Scheffé test, Pearson correlation coefficients, and multiple regression analysis. **Results:** The average scores for awareness of patient safety culture, partnership with patients' parents, and pediatric patient safety nursing activities were 3.37 ± 0.41 , 3.94 ± 0.41 , and 4.50 ± 0.38 , out of 5 points respectively. The factors influencing pediatric patient safety nursing activities were identified as a partnership with patients' parents ($\beta = .41$, $p < .001$). Among hospital-related characteristics, safety management committee ($\beta = .16$, $p = .029$) and safety management regulations ($\beta = .17$, $p = .016$) were also analyzed as factors influencing patient safety nursing activities. These factors accounted for 29.2% of the explanatory power for pediatric patient safety nursing activities. **Conclusion:** Based on the above study results, we found that to promote safe nursing activities for pediatric patients, developing and implementing training programs that enhance partnerships with patient's parents was imperative, and establishing work regulations and a safety management committee to systematically manage safety management tasks was deemed important.

Keywords: Parents; Patient safety; Pediatric nursing; Safety management

INTRODUCTION

Patient harm resulting from unsafe care is a significant and increasing global public health concern that ranks high among the leading causes of death and disability [1]. Safety incidents encompass any errors, mistakes, events, accidents,

or deviations, irrespective of whether they result in harm to patients [2]. The types of patient safety incidents in hospitals are drug-related incidents, accounting for 43.3%, followed by falls (38.8%) and injuries (3.3%); the safety incident rate for hospitalized children under 10 years old in South Korea was reported as 7.1% in 2022 [3]. Considering that safety acci-

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dents among hospitalized children not only impact the health of this population but also cause prolonged hospital stays and additional cost burdens associated with examinations and treatments, preventing safety accidents among hospitalized children is crucial [4].

Safety nursing activities aim to prevent patient injury and accidents during the delivery of medical services [2]. This is a fundamental principle of healthcare provision, determines the quality of healthcare, and is a foremost activity for enhancing patient safety, which is the duty of all healthcare practitioners [5]. Children, due to their developmental characteristics, have strong impulses of curiosity and exploration. However, since their physical functions are not fully developed, they often lack the ability to cope with risks, leaving them constantly exposed to the dangers of accidents [6]. Therefore, safety nursing activities for hospitalized children are emphasized more than for any other group [7]. Patient safety culture is defined as the outcome of interactions between values, attitudes, perceptions, abilities, and behavioral patterns, which together determine the commitment of organizational members and individual or organizational capabilities for managing health and safety in the workplace [2]. Organizations that cultivate a positive safety environment are marked by open communication built on mutual trust, collective beliefs in the importance of safety, and confidence in the effectiveness of proactive measures [2]. In other words, safety culture encompasses the perception of fostering unconscious expressions of safety consciousness and establishing the value of safety first, as well as activities that induce primary changes in behavior patterns [8]. Nurses in hospitals play a crucial role in reducing the incidence of safety accidents through safety nursing activities [8]. Thus, nurses' awareness of safety culture plays a vital role in enhancing patient safety [9]. Especially in pediatric wards, where children may have a lower perception of danger, safety culture awareness among members is more significant than that in other nursing units [7]. The perception of patient safety culture [9,10] significantly influences nurses' patient safety nursing activities and has been observed to enhance healthcare quality by increasing the performance rate of these safety-related activities [10]. However, as previous studies primarily focused on investigating nurses in adult patient wards, it is necessary to determine whether the perception of pediatric nurses regarding patient safety culture affects the performance of pediatric patient safety practices.

The partnership between pediatric nurses and the parents

of hospitalized children (referred to as the nurse-parent partnership) refers to a cooperative relationship between nurses and parents with a common goal of providing optimal care to their child [11]. Hospitalized children often display limited verbal proficiency, lack the capability to make judgments and decisions regarding their health issues, and rely on their parents for support [11]. Furthermore, unforeseen or adverse events associated with medical care can induce physical and mental challenges for pediatric patients and their families [12]. Therefore, the nurse-parent partnership holds significant importance in mitigating such difficulties [11]. The World Health Organization's Global patient safety action plan 2021–2030 also emphasizes the significance of involving patients and their families at all levels of healthcare to ensure safe healthcare practices [1]. According to a previous study, when parents of pediatric patients participated in prevention activities by observing and reporting inappropriate behaviors in procedures such as medication administration, line management, and infection prevention, as well as communicating with healthcare providers, errors were reduced [13]. Such partnerships with parents of pediatric patients are relevant to the safety of hospitalized children. However, research on partnerships between nurses and parents of pediatric patients and the safety of hospitalized children has mainly been conducted in foreign countries [13,14]. In South Korea, research has been conducted on the safety nursing activities of nursing students for hospitalized children [7], and most of previous studies pertain to the safety nursing activities of general ward [8-10].

Accordingly, this study aims to identify the influence of pediatric nurses' perceptions of patient safety culture and their partnership with parents of child patients on pediatric patient safety nursing activities. The findings will serve as foundational data for the development of strategies to promote patient safety nursing activities for hospitalized children.

METHODS

Ethical statements: This study was approved by the Institutional Review Board (IRB), designated by the Dongguk University (IRB No. DGU IRB 20220022-1). All participants provided informed consent.

1. Study Design

This descriptive study aimed to investigate the effects of the perception of patient safety culture and pediatric nurse-parent partnership on patient safety nursing activities among pediatric nurses. This study followed the guidelines established by the Strengthening of the Reporting of Observational Studies in Epidemiology [15].

2. Participants

This study involved nurses with more than 6 months of experience working in wards where children are hospitalized, including children's hospitals, general hospitals, and university hospitals. These criteria were based on a study showing that nurses with fewer than 6 months of experience differed from their more experienced pediatric counterparts, as they were new to the profession or had moved from another ward, and were thus in the process of adapting to such a new environment [16].

The sample size for this study was calculated using the G*power 3.1.9.7 program [17]. Assuming a medium effect size of .15, a significance level of $\alpha = .05$, a power ($1-\beta$) of .90, and twelve predictors in a multiple regression analysis, a minimum of 157 participants was required. To account for a potential dropout rate of 15%, the survey questionnaires were distributed to 181 participants. However, only 165 participants were included in the final analysis, as 16 questionnaires were incomplete and therefore excluded.

3. Measurements

1) Perception of patient safety culture

The perception of patient safety culture was assessed using the Korean version of the Hospital Survey on Patient Safety Culture 2.0 (K-HSOPSC 2.0), which was originally designed by the Agency for Healthcare Research and Quality and subsequently translated into Korean. This tool was used to assess reliability, content validity, and construct validity in Lee and Dahinten's study [18]. K-HSOPSC 2.0 consists of 31 items with 10 subdomains, with each rated on a 5-point Likert scale ranging from 1 point ("not at all or never happens") to 5 points ("strongly agree or always happens"). Among the 31 items, three were related to teamwork; three to staffing and work pace; three to organizational learning-continuous improvement; four to response to error; three to

supervisor, manager, or clinical leader support for patient safety; three to communication about error; four to communication openness; two to reporting patient safety event; three to hospital management support for patient safety; and three to handoffs and information exchange. Examples of items in the tool include "Our department has sufficient staff to handle the workload," "Similar patient safety issues continue to occur in our department," "Adequate time is provided to exchange important patient information during handovers," and "Hospital administrators provide sufficient resources for improving patient safety." Twelve negatively worded questions were reverse scored, with a higher score indicating a more positive perception of patient safety culture. The original reliability of this tool at the time of its development was measured with Cronbach's α coefficient, yielding a value of .77 [19]. The K-HSOPSC 2.0, which was translated into Korean and modified by Lee and Dahinten [18], obtained a Cronbach's α value of .67-.89. However, the overall reliability was not indicated. In this study, this instrument obtained a Cronbach's α value of .87.

2) Nurse-parent partnership

The nurse-parent partnership was evaluated using the Pediatric Nurse Parent Partnership Scale designed for nurse use, which was developed by Choi and Bang [11]. This tool consists of 34 items across 7 subdomains: 9 items related to reciprocity, 2 items related to cautiousness, 3 items related to collaboration, 6 items related to sensitivity, 3 items related to shared information, 4 items related to communication, and 7 items related to professional knowledge and skills. Each item is rated on a 5-point Likert scale, from 1 point ("not at all") to 5 points ("strongly agree"), with higher score indicating a more positive perception of nurse-parent partnership. The tool had Cronbach's α values of .96 at the time of development [11] and .93 in this study.

3) Pediatric patient safety nursing activities

Pediatric patient safety nursing activities were assessed using a tool developed by Park, Oh, and Kim [7], which consists of 8 subdomains with a total 60 items related to hospitalized pediatric patient safety nursing activities. These items were derived from 119 items designed to evaluate nurses' patient safety nursing activities, developed by the Korea Health Industry Development Institute [20]. This tool includes of 8 subdomains with a total of 60 items, including falls (12 items), safety education (4 items), infection (11

items), firefighting (4 items), patient identification (4 items), medication (8 items), blood transfusion (10 items), and injury prevention (7 items). Each item was rated on a 5-point Likert scale, from 1 point (“not very important”) to 5 points (“very important”). A higher score indicates a more positive perception of patient safety nursing activities. The tool demonstrated Cronbach’s α values of .87 in a study by Park et al. [7] and .95 in the present study.

4. Data Collection

Data were collected from October 2022 to November 2022 using structured questionnaires. The study involved four children’s hospitals and nine general hospitals and university hospitals in seven regions (Seoul, Gyeonggi, Gyeongbuk, Gyeongnam, Busan, Ulsan, and Daegu). For in-person data collection, the researchers either contacted or visited the head of the nursing department at each hospital; explained the study’s purpose, data collection methods, and related details; and obtained verbal consent for data investigation. Then, the head nurse in the pediatric ward explained the purpose of this study to nurses with at least half a year of experience, obtained written consent, and collected the necessary data.

In instances where face-to-face meetings were declined due to the risk of contracting Coronavirus disease 2019, data from pediatric nurses were collected using snowball sampling. The researchers sent a uniform resource locator (URL) containing the structured questionnaires to acquaintances, allowing nurses with over 6 months of working experience in children’s hospitals, general hospitals, and university hospitals to complete the questionnaire. Upon clicking the URL, the initial screen describes the necessity, purpose, procedures, and methods of the study; an anonymity and confidentiality guarantee; voluntary consent and withdrawal option; and other relevant details. The nurses were instructed to click on a separate study participation consent URL, where they were prompted to input their names directly on the screen to provide consent. Subsequently, the participants were asked to participate in the survey, which typically required approximately 10 minutes to complete. Individuals encountering difficulty understanding the content of the questionnaire were encouraged to reach out to the researchers, allowing the researchers to provide guidance and support in understanding and completing the questionnaire.

5. Data Analysis

Data analysis was performed using the SPSS/WIN 26.0 program (IBM Corp.). Descriptive analysis was used to assess participants’ general and hospital-related characteristics, perception of patient safety culture, nurse-parent partnership, and patient safety nursing activities. Independent t-tests and one-way ANOVA were employed to determine differences in key variables based on participants’ general and hospital-related characteristics. Post-hoc test was performed using the Scheffé test. Pearson’s correlation coefficients were used to examine relationships between major variables, and multiple regression analysis was performed to identify factors affecting patient safety nursing activities among pediatric nurses.

RESULTS

1. General and Hospital-Related Characteristics of the Participants

Of the 165 participants, 96.4% ($n=159$) were women. The mean age was 33.0 ± 7.4 years, and the proportion of those aged 30–39 years old was the highest (49.7%, $n=82$). In terms of marital status, 59.4% ($n=98$) were unmarried, and 63.6% ($n=105$) had no children. In terms of education level, 57.6% ($n=95$) of the participants completed a 4-year nursing degree, while 30.3% ($n=50$) only 3-year nursing program. In terms of position, 87.9% of the participants were staff nurses ($n=145$), 8.5% ($n=14$) were charge nurses, and 3.6% ($n=6$) were head nurses. The mean working experience was 8.59 ± 7.02 years. Approximately 37.6% ($n=62$) of the participants had over 10 years of working experience, while 23.6% ($n=39$) had a working experience of over 5 years to less than 10 years. Meanwhile, 81.8% ($n=135$) of the participants had safety training experience, 97% ($n=160$) reported the presence of safety management work regulations, and 84.2% ($n=139$) reported the existence of a safety management committee (Table 1).

2. Perception of Patient Safety Culture, Nurse-Parent Partnership, and Pediatric Safety Nursing Activities

Out of 5 points, the participants obtained mean scores of 3.37 ± 0.41 for the perception of patient safety culture, 3.94 ± 0.41 for nurse-parent partnership, and 4.50 ± 0.38 for

Table 1. Differences of Main Variables according to General & Hospital related Characteristics (N=165)

Characteristics	n (%)	Patient safety culture		Nurse-parent partnership		Patient safety nursing activities	
		M±SD	t/F (p)	M±SD	t/F (p)	M±SD	t/F (p)
Sex							
Male	6 (3.6)	3.39±0.34	0.16 (.870)	4.16±0.34	1.35 (.178)	4.42±0.54	0.55 (.583)
Female	159 (96.4)	3.36±0.41		3.93±0.41		4.51±0.37	
Age (year)							
≤29 ^{a)}	59 (35.8)	3.48±0.36	5.58 (.005) a)> b)	4.03±0.38	2.63 (.075)	4.55±0.37	0.76 (.468)
30–39 ^{b)}	82 (49.7)	3.26±0.44		3.87±0.40		4.47±0.39	
≥40 ^{c)}	24 (14.5)	3.43±0.35		3.93±0.46		4.51±0.36	
Marital status							
Single	98 (59.4)	3.42±0.39	1.91 (.058)	3.97±0.38	1.20 (.231)	4.52±0.35	0.56 (.579)
Married	67 (40.6)	3.29±0.42		3.89±0.44		4.48±0.41	
Presence of children							
Yes	60 (36.4)	3.33±0.41	-0.80 (.423)	3.92±0.45	-0.53 (.596)	4.51±0.41	0.29 (.775)
No	105 (63.6)	3.39±0.41		3.95±0.38		4.50±0.36	
Education level							
College	50 (30.3)	3.29±0.43	1.15 (.330)	3.84±0.42	2.39 (.071)	4.49±0.43	0.83 (.480)
University	95 (57.6)	3.42±0.37		4.01±0.38		4.54±0.35	
RN-BSN	11 (6.6)	3.30±0.35		3.89±0.43		4.40±0.34	
≥Master degree	9 (5.5)	3.34±0.65		3.81±0.48		4.38±0.43	
Position							
Staff nurse	145 (87.9)	3.36±0.40	1.90 (.154)	3.94±0.39	0.69 (.506)	4.50±0.39	0.59 (.553)
Charge nurse	14 (8.5)	3.32±0.48		3.83±0.46		4.44±0.31	
Head nurse	6 (3.6)	3.68±0.45		4.03±0.56		4.65±0.22	
Length of total career (year)							
>1	14 (8.5)	3.56±0.45	2.02 (.095)	3.94±0.48	1.57 (.184)	4.57±0.40	0.50 (.740)
1 to <3	26 (15.8)	3.39±0.35		4.08±0.48		4.49±0.50	
3 to <5	24 (14.5)	3.37±0.31		3.96±0.41		4.55±0.29	
5 to <10	39 (23.6)	3.44±0.44		3.96±0.39		4.53±0.39	
≥10	62 (37.6)	3.27±0.42		3.85±0.36		4.46±0.35	
Safety education experience							
Yes	135 (81.8)	3.39±0.40	1.71 (.089)	3.95±0.40	0.95 (.341)	4.52±0.37	1.52 (.130)
No	30 (18.2)	3.25±0.43		3.87±0.42		4.41±0.42	
Work regulation for safety management							
Yes	160 (97.0)	3.37±0.41	1.53 (.127)	3.93±0.41	-0.68 (.498)	4.52±0.37	2.77 (.006)
No	5 (3.0)	3.09±0.47		4.06±0.22		4.05±0.30	
Safety management committee							
Yes	139 (84.2)	3.39±0.41	1.95 (.053)	3.96±0.41	1.32 (.190)	4.55±0.35	3.54 (.001)
No	26 (15.8)	3.22±0.38		3.84±0.36		4.27±0.44	

a),b),c) Post hoc test using Scheffé’s test. M, mean; SD, standard deviation; RN-BSN, registered nurse-bachelor of science in nursing.

patient safety nursing activities (Table 2).

3. Differences in Major Variables According to the General and Hospital-Related Characteristics of the Participants

The results of participants’ general and hospital-related characteristics revealed significant differences in a few major variables (Table 1). A significant difference was found in the perception of patient safety culture according to “age” among the general characteristics of the participants (F = 5.58,

p = .005). Post-hoc test results indicated that participants aged 29 or older scored higher in the perception of patient safety culture item (3.48±0.36 points) compared with those aged 30–39 years (3.26±0.44 points).

No significant differences were observed in the nurse-parent partnership. In terms of patient safety nursing activities, participants who reported the availability of “safety management work regulations” scored higher (4.52±0.37 points) than those who reported the unavailability of such regulations (4.05±0.30 points), indicating better performance in patient safety nursing activities (t = 2.77, p = .006). Additionally,

Table 2. The level of Patient Safety Culture, Nurse-Parent Partnership and Patient Safety Nursing Activities (N=165)

Variables	M ± SD	Min.	Max.	Range
Patient Safety Culture (total)	3.37 ± 0.41	2.16	4.29	
Teamwork	3.92 ± 0.53	2.33	5.00	
Supervisor, manager, or clinical leader support for patient safety	3.79 ± 0.61	1.00	5.00	
Handoffs and information exchange	3.63 ± 0.67	2.00	5.00	
Communication about error	3.52 ± 0.73	2.00	5.00	
Organizational learning–continuous improvement	3.39 ± 0.63	1.33	4.67	1–5
Reporting patient safety events	3.34 ± 0.87	1.00	5.00	
Communication openness	3.34 ± 0.65	1.50	4.75	
Response to error	3.09 ± 0.68	1.00	4.75	
Staffing and work pace	2.89 ± 0.69	1.00	4.33	
Hospital management support for patient safety	2.82 ± 0.81	1.00	5.00	
Nurse-parent partnership (total)	3.94 ± 0.41	2.85	4.97	
Sensitivity	4.14 ± 0.46	2.83	5.00	
Professional knowledge & skill	4.01 ± 0.45	2.86	5.00	
Cautiousness	3.97 ± 0.60	2.00	5.00	1–5
Communication	3.92 ± 0.49	2.75	5.00	
Shared information	3.88 ± 0.55	2.67	5.00	
Reciprocity	3.84 ± 0.61	1.33	5.00	
Collaboration	3.72 ± 0.71	1.33	5.00	
Patient safety nursing activities (total)	4.50 ± 0.38	3.00	5.00	
Blood transfusion	4.81 ± 0.44	1.00	5.00	
Identifying patient	4.60 ± 0.55	2.00	5.00	
Infection	4.59 ± 0.44	2.91	5.00	
Medication	4.58 ± 0.45	3.00	5.00	1–5
Safety education	4.56 ± 0.50	2.75	5.00	
Falls	4.52 ± 0.40	3.00	5.00	
Firefighting	4.47 ± 0.60	2.50	5.00	
Injury prevention	3.75 ± 0.96	1.57	5.00	

M, mean; SD, standard deviation; Min., minimum; Max., maximum.

participants who reported the presence of a “safety management committee” obtained a higher mean score (4.55 ± 0.35 points) compared with those who reported the unavailability of such a committee (4.27 ± 0.44 points), indicating enhanced performance in patient safety nursing activities. A significant difference was found between the groups (t = 3.54, p = .001).

4. Correlation Between the Perception of Patient Safety Culture, Nurse-Parent Partnership, and Patient Safety Nursing Activities

Upon analyzing the correlations between the major variables, the results indicated a significant positive correlation between pediatric nurses’ patient safety nursing activities and the perception of patient safety culture (r = .30, p < .001) and nurse-parent partnership (r = .45, p < .001). A significant positive correlation was also found between the perception of patient safety culture and nurse-parent partnership (r = .37, p < .001) (Table 3).

5. Factors Affecting Patient Safety Nursing Activities

To identify the factors influencing patient safety nursing activities in the participants, a multiple regression analysis was performed. The perception of patient safety culture and nurse-parent partnership (which demonstrated a significant correlation with patient safety nursing activities) were used as independent variables. Meanwhile, the presence or absence of safety management work regulations and the presence or absence of a safety management committee were assigned as dummy variables (which showed significant differences in safety nursing activities) (Table 4).

Before performing the regression analysis, the assumptions were evaluated to ensure they were met. The Durbin-Watson statistic stood at 1.99, suggesting no autocorrelation. The tolerance limit was .84–.88, which was above 0.1, while the variance inflation factor was 1.13–1.19, which was below the standard value of 10. These values indicated the absence of multicollinearity. The multiple regression analysis indicated

Table 3. Correlation between Perception of Patient Safety Culture, Nurse-Parent Partnership and Patient Safety Nursing Activities (N=165)

Variables	Perception of patient safety culture	Nurse-parent partnership	Patient safety nursing activities
	r (p)		
Perception of patient safety culture	1		
Nurse-parent partnership	.37 (<.001)	1	
Patient safety nursing activities	.30 (<.001)	.45 (<.001)	1

Table 4. Factors Influencing Perception of Patient Safety Nursing Activity (N=165)

Variables	B	SE	β	t	p-value
Constant	2.18	0.31		7.04	<.001
Safety management committee (yes)	0.16	0.07	.16	2.21	.029
Work regulation for safety management (yes)	0.38	0.16	.17	2.44	.016
Perception of patient safety culture	0.10	0.07	.10	1.44	.153
Nurse-parent partnership	0.38	0.07	.41	5.61	<.001
R ² = .29, Adjusted R ² = .28, F = 16.52, p < .001					

SE, standardized error.

that the regression model was significant (F = 16.52, p < .001); in terms of the variables affecting patient safety nursing activities, nurse-parent partnership emerged as the most influential variable (β = .41, p < .001), followed by the presence of safety management work regulations (β = .17, p = .016) and safety management committee (β = .16, p = .029). The explanatory power of this regression model was 29.2%.

DISCUSSION

This study examined pediatric nurses' perceptions of patient safety culture, nurse-parent partnership, and pediatric patient safety nursing activities, and determined the effects of these variables on pediatric patient safety nursing activities. The participants obtained a mean score of 3.37 ± 0.41 points (67%) out of 5 points in the perception of patient safety culture. In a study assessing nurses working in internal medicine/surgical wards using the same tool, a score of 66% was obtained for the perception of patient safety culture and similar to our study results [21]. In a study evaluating nurses working in intensive care units [22], a score of 77% was obtained for the perception of patient safety culture, which is higher than our study results. One reason for this discrepancy may be that the previous study collected data from nurses in the intensive care unit of a single hospital, while our study surveyed pediatric nurses from a variety of hospitals (pediatric specialty, general, and university hospitals) of different sizes and types across seven regions. This difference in the characteristics of the participants and their working condi-

tions is likely to have contributed to the variations observed [22]. Therefore, it is speculated that differences in nurses' perceptions of patient safety culture may emerge because of patient characteristics and type of hospital in which they work [23]. Further research is warranted to explore the perceptions of patient safety culture among pediatric nurses, considering the work environment and patient characteristics.

The subdomains of patient safety culture perception were analyzed. Results revealed that the teamwork domain had the highest mean score (3.92 ± 0.53 points), which was consistent with the results of a study involving pediatric nurses [24]. Considering the collaborative nature of nursing work, quality nursing care is attained through the facilitation of effective teamwork [25]. Compared with nurses in general wards who provide nursing care to mentally and physically mature adult patients, nurses in pediatric wards must remain vigilant to the conditions of pediatric patients, emphasizing the need for skilled nursing care. Consequently, teamwork may play a critical role in delivering quality nursing care to pediatric patients. In this study, the subdomain score for hospital management support for patient safety was the lowest (2.82 ± 0.81 points). This result was consistent with the results of a study involving general hospitals in Seoul and Gyeonggi [21] and another study involving large hospitals with over 1,000 beds [26]. This observation indicates that despite the variations in regional and hospital size, the perceived adequacy of hospital management support for patient safety culture is insufficient. Hence, the hospital management's in-

creased interest and substantial support for safety culture is required.

The study participants obtained a mean score of 3.94 ± 0.41 (78.8%) out of 5 points in the nurse-parent partnership item. This was slightly higher than the 75% to 77% obtained in studies [27,28] involving pediatric nurses using the same tool, indicating a positive perception of nurse-parent partnership. This finding is consistent with previous study, showing that pediatric nurses perceived nurse-parent partnership as important due to the numerous opportunities available for forming nurse-parent partnerships [28]. Among the subdomains of the nurse-parent partnership, the sensitivity scored the highest, which was consistent with the results of a previous study involving pediatric nurses [27]. This could be attributed to participants closely observing changes in, paying close attention to, and responding sensitively to pediatric patients' conditions while providing nursing care. Given that these attitudes of pediatric nurses positively impact the hospitalization experience of patients and their parents, continuous efforts are required to ensure sensitivity [11]. Among the subdomains, collaboration with pediatric patients' parents obtained the lowest mean score (3.72 ± 0.71). The study by Shin and Kim [29] similarly reported low scores for the collaboration subdomain (3.36 ± 0.56), supporting the results of this study. To provide quality nursing care to pediatric patients, pediatric nurses need to have a positive attitude to provide family-centered nursing care, collaborating with parents in developing and implementing care plans [29]. Pediatric nurses need to recognize the importance of establishing collaborative relationships with parents of pediatric patients and make various efforts to enhance this collaboration. Additionally, specific strategies for building collaboration should be discussed for pediatric nursing practice policies [11].

The participants scored relatively high in the pediatric patient safety nursing activities (4.50 ± 0.38 out of 5 points, 90%). This suggests that the participants were proficient in executing safety nursing activities. A previous study involving nurses in general wards [9] also reported a safety nursing activity performance rate of 88%. As medical institutions undergo hospital accreditation evaluation, they improved the nurses' perception of patient safety based on the patient safety-related assessment criteria [9]. This process involved the activation and monitoring of autonomous reporting of patient safety events, which are believed to have positive effects on patient safety nursing activities [10]. Among the subdo-

main of the patient safety nursing activities, the score for blood transfusion was the highest. However, the score in this domain was only slightly higher than that in previous studies [7,9], which reported the highest score for blood transfusion. Given the potential serious risks associated with blood transfusion, such as transfusion-associated circulation overload accompanied by lung injury, the participants in this study were conscientious about adhering to the blood transfusion procedure. They closely monitored and managed patients receiving blood transfusions, contributing to the high score in the blood transfusion domain. Meanwhile, the score for injury prevention was the lowest. This can be attributed to the survey items, indicating that the dedicated washbasins and toilets for children are only available in select hospitals. Medical institutions should proactively conduct facility safety and environment management. To prevent pediatric patient safety accidents, organizational support, such as developing guidelines for the installation and operation of washbasins and toilets, is needed.

This study found a significant positive correlation between patient safety nursing activities, perception of patient safety culture, and nurse-parent partnership in pediatric nurses. A number of previous studies [9,10] have reported a positive correlation ($r = .22-.55$) between the perception of patient safety culture and patient safety nursing activities in nurses, supporting the results of this study. However, due to the limited research examining the correlation between partnerships with patients' parents and patient safety nursing activities, and between partnerships with patients' parents and awareness of patient safety culture among pediatric nurses, there are limitations to specific discussion. Therefore, further follow-up studies are needed.

When exploring the factors affecting pediatric safety nursing activities in pediatric nurses, results showed that nurse-parent partnership, safety management work regulations and a safety management committee were significant contributors. Specifically, better nurse-parent partnership ($\beta = .41$) and the presence of safety management work regulations ($\beta = .17$) and a safety management committee ($\beta = .16$) were associated with improved patient safety nursing activities. Due to the limited availability of studies examining the nurse-parent partnerships and pediatric patient safety nursing activities, direct comparisons with previous research are challenging. However, a study by Khan et al. [14] found that children's families improved patient safety by monitoring and reporting patient safety accidents that were not detected

by healthcare professionals. In the Khan et al. [14]'s study, the families of hospitalized children were solicited to voluntarily report hospital accidents using a patient safety monitoring tool. As a result, the error reports and reports of adverse events received by pediatric centers were five times higher and three times higher, respectively, than those received by hospitals that did not involve hospitalized children's families in voluntary hospital incident reporting [14]. In the future, pediatric nurses can contribute to reducing patient safety incidents by developing various strategies to enhance nurse-parent partnerships and by devising ways for parents to participate as collaborators in patient safety activities.

A previous study [30] of general nurses using different tools found that safety management work regulations and a safety management committee were factors affecting patient safety nursing activities, supporting the results of this study. Following the implementation of the Patient Safety Law in South Korea, medical institutions were mandated to engage in patient safety-related activities. Safety management work regulations and committee operations significantly influenced safety nursing activities [5,30]. Therefore, policy management is required to ensure that hospital safety management work regulations and a safety management committee are established in all hospitals.

Meanwhile, the perceived patient safety culture, which had a significant correlation with patient safety nursing activities in this study, was identified as not an influential factor for pediatric patient safety nursing activities. One of many reasons for this result is thought to be attributed to the increased need for support in terms of the facilities for pediatric nurses compared with general nurses' patient safety nursing activities. This may be related to the fact that the scores for facility support such as toilet bowls, floors, and wash basins as indicated in the injury prevention subdomain in this study were the lowest.

This study is significant as it explored the effects of nurse-parent partnerships on pediatric patient safety nursing activities in pediatric nurses. This significance arises from a lack of previous studies exploring nurse-parent partnerships and pediatric patient safety nursing activities. However, this results of this study revealed that the combined explanatory power of nurse-parent partnership, safety management work regulations and a safety management committee for pediatric nurses' pediatric patient safety nursing activities was only 29.2%. A study by Jeong and Jeong [5] identified the percep-

tion of the importance of patient safety management and patient safety competence in nurses as major variables directly affecting patient safety nursing activities. This suggests that other variables may have an important influence. As such, this implies that other major factors, in addition to nurse-parent partnership and the perception of patient safety culture, can affect pediatric patient safety nursing activities. Hence, further studies are needed to identify and understand these additional factors. In addition, the patient safety culture perception level of the participants was lower compared with other variables and did not affect patient safety nursing activities. Therefore, future studies in different regions are essential to confirm the relationship between the two variables.

This study has some limitations. First, despite the availability of various tools for measuring patient safety nursing activities and the significance of nurse-parent partnerships in pediatric nursing, the number of related domestic studies is limited. Hence, it was difficult to directly compare the results of this study with those of other previous studies. Second, pediatric patient safety nursing activities were assessed based on the participants' self-report, thus introducing subjectivity. Hence, subjectivity should be considered when interpreting the results of this study. Third, the participants in this study were convenience sampling, and some data were collected online through URL access. An online self-report survey offers convenience and a representative sample, one drawback is the potential for participants' attention to be diverted by environmental stimuli during survey participation, leading to insincere responses [31]. Hence, further studies are needed to validate and supplement these findings.

CONCLUSION

The investigation into the effects of the perception of patient safety culture and nurse-parent partnership on pediatric patient safety nursing activities in pediatric nurses showed that nurse-parent partnership, safety management work regulations and a safety management committee significantly influenced such activities. Although the nurse-parent partnership domain scored relatively high in this study, enhancing this domain requires the development and implementation of nurse-parent partnership enhancement education programs that emphasize the necessity and process of forming positive collaborative relationships between pediatric nurses and pediatric patients' parents. Additionally, this study confirmed that pediatric patient safety nursing activi-

ties were performed better when safety management work regulations and a safety management committee were implemented. Therefore, establishing such regulations and a safety management committee and offering situation-specific preparedness education programs are essential to prevent safety accidents and facilitate the effective implementation of patient safety nursing activities. Furthermore, improving the working environment of nurses in pediatric hospitals and establishing organizational environmental and institutional support such as facility assistance will be necessary to enhance pediatric nurses' patient safety nursing activities.

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Authors' contribution

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Conflict of interest

The authors have no existing or potential conflicts of interest to declare.

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Data availability

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ORCID and ResearcherID

Seo Jin Lee <https://orcid.org/0009-0009-7810-0777>
<https://researcherid.com/rid/KAM-7189-2024>
 Young Ran Han <https://orcid.org/0000-0002-0539-0496>
<https://researcherid.com/rid/JZT-6183-2024>

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