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General Hospitals with High-Tech Medical Equipment and Patient Experience

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Abstract

This study investigates the relationship between the retention of high-tech medical equipment in medical institutions in South Korea and patient experience evaluation outcomes. Data were sourced from the third Patient Experience Assessment conducted by the Health Insurance Review and Assessment Service (HIRA), a South Korean agency, and HIRA's 2021 data on medical equipment. A total of 320 institutions equipped with CT, MRI, and PET scans or only CT and MRI were analyzed. The dependent variable was the average score across six patient experience dimensions: overall, nurses, doctors, medication and treatment, hospital environment, and guarantee of patient rights. Multiple regression analysis revealed that institutions with CT, MRI, and PET scans scored higher in-patient experience, particularly in the overall dimension (2.15 points), hospital environment (2.22 points), patient rights (1.77 points), and doctors (1.54 points). These findings suggest that high-tech medical equipment positively influences patient satisfaction with care quality. Medical institutions should consider these factors when aiming to enhance patient experience.

Keywords

medical institution, high-tech imaging technology, patient experience, hospital environment, high-tech medical equipment

Introduction

Healthcare organizations facing the challenge of delivering differentiated care experiences because the concept of healing has expanded to include satisfaction of the patients as well as providers.[1,2] In response, medical institutions sought to honor patients' rights to self-determination and constructed a patient-centered medical care system.[3,4] Patients gather medical information through various media, become more active and proactive in utilizing medical services than before, and expect medical staff to be proactive and respectful of patients.[5] The OECD emphasizes the importance of patient-centered care by considering patient experience in its entirety.[6] Patient experience is defined as the sum of patients' perceptions of their interactions with healthcare providers, hospital facility safety, and the entire care process.[5,7]

Healthcare organizations aim to achieve patient-centricity from a psychological perspective to better serve their patients.[8] In 2001, patient-centeredness emerged as a key component of healthcare quality in the United States, and many countries implemented patient experience measures to assess healthcare quality.[9] Following the recommendations of the OECD, the Korea Health Insurance Review and Assessment Service (HIRA) has been conducting patient experience assessments since 2017 to promote a patient-centered medical culture and enhance the quality of medical care experienced by the public.[10]

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The HIRA in South Korea, as part of its appropriateness evaluation of healthcare facilities, conducts telephone surveys every two years with patients discharged from advanced general hospitals and general hospitals with more than 500 beds.[10] These surveys assess patients' experiences in five areas: nursing, doctor, medication and treatment, hospital environment, and protection of patient rights during their hospital stays. The HIRA publishes the collected data on these experiences and overall patient satisfaction for general access.[10] Starting with the 2021 assessment, HIRA expanded the scope of medical institutions subject to assessment to include all general hospitals. According to the results of the third patient experience evaluation, nursing services scored the highest, followed by the hospital environment, medication, and treatment dimensions, whereas the patient rights protection dimension scored the lowest.[11]

A study in South Korea examined the link between hospital characteristics and patient experiences. They found large differences in patient experiences depending on factors such as hospital structure and operations, type of care provided, number of beds, percentage of superior rooms, and percentage of specialist staff.[10] Consequently, patient experience evaluations are typically conducted in large general hospitals or medical institutions, with most institutional characteristics influencing outcomes.[5] Nevertheless, there is a relative scarcity of studies exploring the link between the level of medical resources and patient experience. The perception of medical and ancillary services within a hospital, which represents a blend of high-tech and high-touch approaches, influences patient experience.[12] One study found that factors such as the number of beds, nursing quality, regional location, establishment type, profitability, and medical equipment positively impact patient experience ratings.[7] More recently, another study identified the factors influencing patient experience evaluations based on the structural and operational characteristics of medical institutions and regional features.[5] This study was somewhat abstract, as it defined the status of 12 types of medical equipment, including specialized diagnostic radiological devices and oncology treatment apparatuses, and simultaneously considered multiple medical devices.[5]

When evaluating patient experience, it is imperative to consider both the technical and emotional dimensions.[5] Specifically, a significant portion of a medical facility's technical aspects, including the medical equipment used in healthcare services, are intricately linked to patient experience.[5] Numerous studies have investigated the correlation between technically advanced equipped health care institutions and the quality of care delivered by the patient's experience.[13–15] Conversely, most of the research is comprised of single-case studies that investigate the implementation of specific medical technology within a single institution. Thus, the large amount of high-tech medical institutions and their impact on patient experience must be investigated using institution characteristics. Furthermore, it was vital to examine the relationship between public and private hospital ownership of expensive medical equipment like CT, MRI, and PET scans, which constitute a significant portion of medical facilities' expensive assets, and the outcomes of patient experience surveys, while also examining the characteristics of medical institutions. Therefore, this study investigated the relationship between the level of high-tech medical equipment and patient experience evaluation in Korea.

Materials and Methods

DATA

This study employed HIRA data from 2021, including medical institution status and the third wave of patient experience evaluation. HIRA has been conducting patient experience evaluations since 2017, focusing on 95 tertiary and general hospitals with over 500 beds. We used claims data from each medical institution to generate samples based on gender, age, and medical department. Patients' contact information is obtained from each medical institution, and telephone surveys regarding their inpatient experiences are conducted by HIRA. Target patients are 19 years or older, hospitalized for at least one day, and discharged within 2 to 56 days (8 weeks) before the survey. The evaluation excluded patients from day hospitals, palliative care units, pediatric and psychiatric departments.[10]

The study employed the 2021 patient experience evaluation at the institutional level, which employs structural questionnaires to gather information on the operational characteristics and appropriateness evaluation of medical institutions.[16] The HIRA's website made all the data publicly accessible in August 2022. The data of medical imaging technologies, such as the number of CT, MRI, and PET scans, are collected from HIRA's "Detailed Status of Medical Equipment" to determine the status of high-tech medical equipment in 2021.[17,18]

A total of 359 institutions were recorded in the 2021 HIRA dataset. We excluded 35 medical institutions that did not perform patient experience evaluations and eliminated 4 institutions that possessed no medical imaging technology or anyone such as CT. The final analysis included 320 medical institutions that possessed both high-tech medical imaging technology CT, MRI and PET or CT and MRI (Figure 1).

Measures

Dependent variable. The dependent variable was the average score for each dimension of patient experience evaluation conducted at the 320 medical institutions selected for the third patient experience evaluation. HIRA's patient experience evaluation dimensions included nurse, doctor, medication and treatment, hospital environment, patient rights, and overall satisfaction.[19] The nurse dimension included four items: respect and courtesy, listening, hospital life explanations, and addressing help requests. The doctor dimension

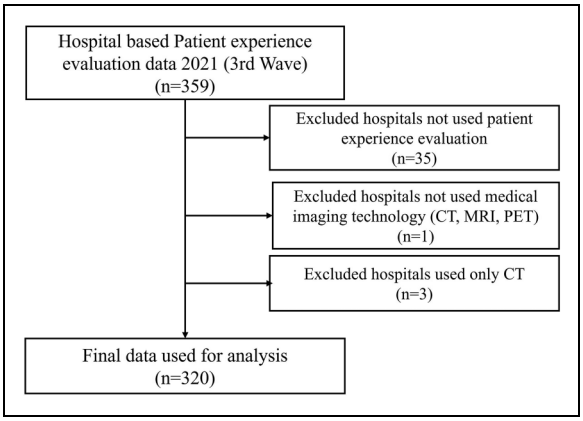

Figure 1. Flowchart for selection process of study subjects.

included four items: respect, listening, opportunities to talk, and rounding times. Other dimensions assessed medication explanations, cleanliness and safety, fair treatment, ease of filing complaints, and overall hospital experience, including recommendation likelihood, the details of the dimensions and scores are presented in Supplementary Table 1.

General Characteristics. The variable of interest in this study was the level of high-tech medical equipment provided by medical institutions. We classified this level based on the presence of representative high-tech medical equipment such as CT, MRI, and PET scans. We categorized the medical institutions under study into those with all three types of equipment (CT, MRI, and PET) and those with only CT and MRI based on detailed data from the HIRA.

Discharge Characteristics. In this study, the independent variables included the type of medical institution, ownership type, location, establishment duration, affiliation with a medical school, number of beds, and number of specialists. We categorized the types of medical institutions into general and tertiary hospitals and the subjects of patient experience evaluation. We divided ownership types into public and private institutions, and classified locations into metropolitan and non-metropolitan areas. We classified the establishment duration into increments of 10 years: less than 10 years, 10 to less than 20 years, 20 to less than 30 years, 30 to less than 40 years, and 40 years or more. We categorized the affiliation with a medical school based on whether the medical institution was affiliated with a main hospital (non-affiliated). We classified the number of beds into three groups: less than 300 beds, 300 to less than 500 beds, and 500 beds or more. We divided the number of specialists into four groups: less than 25, 25 to less than 50, 50 to less than 100, and 100 or more.

Statistical Analysis

We conducted a basic statistical analysis to understand the distribution of the patient experience evaluation results at the target institutions. We performed t-tests and ANOVA to identify differences in the itemized results of patient experience evaluations based on the characteristics of the target institutions. A multiple regression analysis was performed to examine the relationship between the level of high-tech medical equipment and the selected evaluation dimensions of the patient experience. Which adjusted with potential confounders through the hierarchical approach of medical institution characteristics. The analysis results were reported as β values and standard errors (SE). The data collected for this study were processed and analyzed using SAS version 9.4 statistical software, with statistical significance set at $P < .05$.

Results

Characteristics of the Medical Institutions Studied and Patient Experience Evaluation Results

Table 1 shows the level of high-tech medical imaging equipment and the results of patient experience evaluations based on the characteristics of the target institutions. Among the target institutions, 115 (35.9%) patients underwent computed tomography (CT MRI, and PET scan, while 205 (64.1%) had only CT and MRI. General hospitals accounted for the majority of medical institutions with 275 (85.9%), whereas tertiary hospitals accounted for 45 (14.1%). In terms of establishment type and location, private medical institutions constituted the majority 273 (85.3%), while public institutions accounted for 47 (14.7%). Medical institutions located in metropolitan areas numbered 120 (37.5%), whereas those in non-metropolitan areas numbered 200 (62.5%), including institutions in diverse regions. The establishment duration was categorized as follows: less than 10 years (37 institutions, 11.6%), 10 to less than 20 years (79 institutions, 24.7%), 20 to less than 30 years (68 institutions, 21.3%), 30 to less than 40 years (85 institutions, 26.6%), and 40 years or more (51 institutions, 15.9%). Regarding affiliation with a medical school and the number of beds, non-affiliated institutions accounted for 282 (88.1%), while affiliated institutions accounted for 38 (11.9%). The number of beds was categorized as follows: less than 300 beds (102 institutions, 31.9%), 300 to less than 500 beds (107 institutions, 33.4%), and 500 beds or more (111 institutions, 34.7%). The number of specialists was categorized as follows: less than 25 (68 institutions, 21.3%), 25 to less than 50 (91 institutions, 28.4%), 50 to less than 100 (64 institutions, 20.0%), and 100 or more (97 institutions, 30.3%).

The average patient experience evaluation scores for each dimension at the medical institutions were as follows: nurse (86.0), hospital environment (82.4), overall assessment (81.9), medication and treatment (81.9), doctor (81.5), and patient rights dimension (75.7 points). The patient experience evaluation results based on the level of high-tech medical equipment showed that institutions with CT, MRI, and PET scans had higher scores than those with only CT or MRI. In the overall dimension, institutions having CT, MRI, and

Table 1. Characteristics of the Medical Institutions Studied and Patient Experience Evaluation Results.

	Total		Overall			Nurse			Doctor			Medication and treatment			Environment			Patient rights		
Category	N	%	Mean	SD	*P*	Mean	SD	*P*	Mean	SD	*P*	Mean	SD	*P*	Mean	SD	*P*	Mean	SD	*P*
Total	320	100.0	81.9	4.9		86.0	3.3		81.5	3.3		81.9	3.4		82.4	5.5		75.7	3.8	
Having high-tech Medical Equipment					<.0001			<.0001			<.0001			<.0001			<.0001			<.0001
CT, MRI	205	64.1	80.1	4.7		84.8	2.8		80.6	3.1		80.7	3.0		82.0	5.5		74.4	3.3	
CT, MRI, PET scan	115	35.9	85.1	3.6		88.2	3.0		83.2	3.0		84.0	3.0		85.0	4.2		77.9	3.5	
Type of medical institutions					<.0001			<.0001			<.0001			<.0001			<.0001			<.0001
General Hospital	275	85.9	81.2	4.8		85.6	3.2		81.2	3.2		81.4	3.3		81.8	5.4		75.2	3.6	
Tertiary Hospital	45	14.1	86.2	3.0		89.0	2.4		83.4	3.1		84.9	2.9		86.5	3.5		78.6	3.6	
Type of Ownership					<.0001			.0002			.0511			<.0001			<.0001			.0011
Private	273	85.3	81.4	4.9		85.8	3.4		81.4	3.4		81.6	3.5		82.0	5.5		75.4	3.8	
Public	47	14.7	85.2	3.5		87.4	2.5		82.4	2.8		83.5	2.4		85.0	4.2		77.3	3.2	
Location					.4406			.0220			.9081			.1811			.0152			.3515
Metropolitan area	120	37.5	82.2	5.5		86.6	3.4		81.5	3.5		82.2	3.7		83.4	5.7		75.9	4.1	
Other areas	200	62.5	81.7	4.5		85.7	3.2		81.5	3.2		81.7	3.2		81.9	5.3		75.5	3.5	
Duration of Establishment					.0005			.0014			.0005			<.0001			.0004			.0014
Below 10 years	37	11.6	82.7	4.2		86.4	3.4		81.9	2.8		81.9	2.9		85.4	4.9		76.1	3.4	
10 - 19 years	79	24.7	80.4	5.0		85.1	3.4		80.8	3.1		80.8	3.2		81.1	5.1		74.4	3.5	
20-29 years	68	21.3	81.1	5.0		85.5	3.2		80.7	3.6		81.3	3.6		81.7	5.5		75.3	3.7	
30-39 years	85	26.6	82.5	5.0		86.4	3.1		81.8	3.2		82.3	3.4		82.1	5.7		76.1	3.8	
40 or over	51	15.9	83.9	4.1		87.3	3.0		83.0	3.2		83.6	3.1		83.8	4.9		77.0	3.9	
Medical School Affiliation					<.0001			<.0001			.0014			<.0001			<.0001			<.0001
No	282	88.1	81.4	4.9		85.7	3.3		81.3	3.3		81.6	3.3		82.0	5.5		75.3	3.7	
Yes	38	11.9	85.5	3.3		88.5	2.7		83.1	3.3		84.4	2.9		85.6	3.8		78.3	3.7	
Number of Beds					<.0001			<.0001			<.0001			<.0001			<.0001			<.0001
Below 300	102	31.9	79.6	4.8		84.7	3.0		80.6	3.3		80.5	3.2		80.1	5.4		74.1	3.4	
300-499	107	33.4	81.0	4.5		85.2	3.1		80.9	3.2		81.2	3.1		81.6	5.1		75.1	3.4	
500 or more	111	34.7	84.9	3.8		88.0	2.8		83.0	3.0		83.9	3.1		85.5	4.3		77.7	3.6	
Number of Doctor					<.0001			<.0001			<.0001			<.0001			<.0001			<.0001
Below 25	68	21.3	79.2	4.7		84.3	3.0		80.3	3.0		80.2	2.9		79.0	5.8		73.9	3.2	
25-49	91	28.4	80.3	4.4		84.9	2.6		80.7	3.2		80.7	3.0		80.9	4.6		74.5	3.2	
50-99	64	20.0	81.7	5.2		85.8	3.5		81.3	3.4		81.8	3.4		82.9	5.1		75.4	3.8	
100 or more	97	30.3	85.4	3.1		88.5	2.5		83.3	2.8		84.3	2.7		86.0	3.9		78.2	3.3	

Abbreviation: N, Number; SD, Standard Deviation.

PET scans scored an average of 85.1 points, which was 5.0 points higher than the average score of 80.1 points for institutions having only CT and MRI, showing the largest difference. In the other dimension, the average score differences ranged from a minimum of 2.6 points in the doctor dimension to a maximum of 3.5 points in the patient rights dimension, with differences of 3.0 points in the hospital environment dimension, 3.3 points in the medication and treatment, and 3.4 points in the nurse dimension.

Patients' Experience Evaluation by Possession of High-Tech Medical Equipment by Type of Medical Institution

The *patients' experience evaluation* results showed that both tertiary and general hospitals had higher patient experience ratings in all dimensions of both hospitals with CT, MRI, or PET scans ($P < .001$). In type of high-tech technology medical institutions category, medical institutions with CT, MRI, and PET had the greatest difference, with an average score of 85.1 points higher than the average score of 80.1 for medical institutions with only CT and MRI. The overall results of the patient experience evaluation according to high-tech Medical Equipment by type of medical institution are shown in (Figure 2).

The Association Between the Patient Experience Evaluation and Characteristics of the Study Subjects and Medical Institution

Table 2 shows the association between the level of high-tech medical equipment and patient experience evaluation outcomes. Medical institutions with CT, MRI, and PET scans recorded higher average scores across all dimensions than those with only CT or MRI scans. Statistically significant differences were found in the overall, doctor, hospital environment, and patient-rights dimensions. In the overall dimension, institutions with CT, MRI, and PET scans scored on average 2.15 points higher than those with only CT and MRI scans ($P = .0167$). In the doctor dimension, the difference was an average of 1.54 points higher ($P = .0256$); in the hospital environment dimension, the difference was 2.22 points higher ($P = .0137$), and in the patient rights dimension, the difference was 1.77 points higher ($P = .0213$). Although the nurse dimension showed an average increase of 1.38 points for institutions with CT, MRI, and PET scans compared to those with only CT and MRI, this difference was not statistically significant ($P = .0574$). Similarly, in the medication and treatment dimensions, institutions with CT, MRI, and PET scans scored an average of 1.18 points higher, but this difference was not statistically significant ($P = .0884$).

The association between the hospital characteristics and patient experience evaluation results showed that national and public medical institutions had higher average scores compared to private medical institutions overall. National and public medical institutions scored 2.54 points higher than private medical institutions in the overall evaluation and statistically significant ($P < .001$). Medical institutions established for 10 to 20 years were 2.31 points lower on average than those established for less than 10 years ($P = .0039$), 20 to 30 years were 2.27 points lower on average ($P = .0042$), and 30 to 40 years were 1.65 points lower on average ($P = .0492$). In medical institutions with over 100 specialists, the average combined evaluation area was 3.16

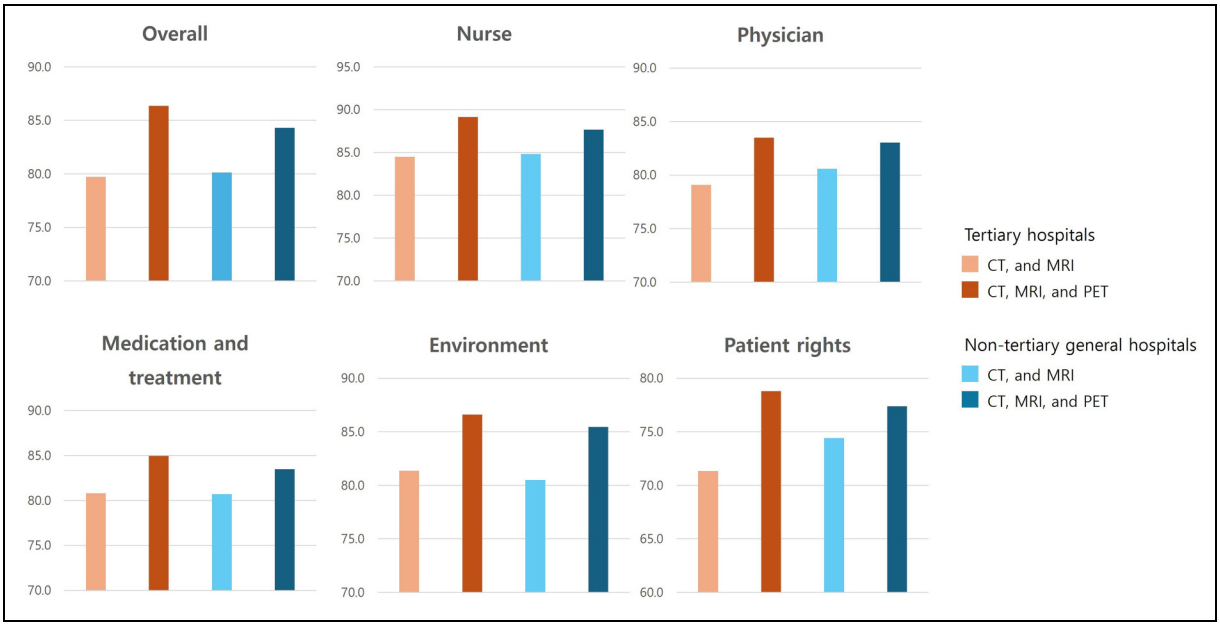

Figure 2. Patient experience evaluation by possession of high-tech medical equipment by type of medical institution.

Table 2. Association Between the Possession of High-Tech Medical Equipment and Patient Experience Evaluation Outcomes.

	Overall		Nurse		Doctor		Medication and treatment		Environment		Patient rights	
Category	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Having high-tech Medical Equipment												
CT, MRI	Ref		Ref		Ref		Ref		Ref		Ref	
CT, MRI, PET scan	2.15*	0.90	1.38	0.73	1.54*	0.69	1.18	0.69	2.22*	0.90	1.77*	0.77
Type of medical institutions												
General Hospital	Ref		Ref		Ref		Ref		Ref		Ref	
Tertiary Hospital	1.71**	0.65	1.23*	0.56	0.31	0.62	1.19	0.61	1.76*	0.74	1.00	0.75
Type of Ownership												
Private	Ref		Ref		Ref		Ref		Ref		Ref	
Public	2.54***	0.66	0.84	0.45	0.32	0.53	1.02*	0.49	2.04**	0.75	0.99	0.60
Location												
Metropolitan area	Ref		Ref		Ref		Ref		Ref		Ref	
Non-metropolitan area	−0.62	0.54	0.01	0.34	−0.69	0.40	−0.32	0.38	0.10	0.57	−0.41	0.45
Duration of Establishment												
Below 10 years	Ref		Ref		Ref		Ref		Ref		Ref	
10-19 years	−2.31**	0.80	−1.28*	0.59	−1.15*	0.52	−1.14*	0.52	−4.31***	0.84	−1.70**	0.61
20-29 years	−2.27**	0.80	−1.27*	0.56	−1.46*	0.58	−1.06*	0.54	−4.53	0.87	−1.19	0.62
30-39 years	−1.65*	0.84	−0.81	0.57	−0.59	0.55	−0.53	0.54	−4.87	0.91	−0.83	0.64
40 or over	−1.03	0.86	−0.62	0.63	0.04	0.64	0.19	0.61	−4.05	0.92	−0.73	0.75
Medical School Affiliation												
No	Ref		Ref		Ref		Ref		Ref		Ref	
Yes	−0.80	0.73	−0.60	0.59	−0.67	0.69	−0.70	0.67	−1.20	0.76	−0.32	0.80
Number of Beds												
Below 300	Ref		Ref		Ref		Ref		Ref		Ref	
300-499	0.05	0.70	-0.38	0.45	-0.23	0.50	-0.20	0.47	-0.37	0.82	0.21	0.53
500 or more	0.11	1.05	-0.39	0.70	0.03	0.78	-0.34	0.74	-0.34	1.14	-0.15	0.78
Number of Doctor												
Below 25	Ref		Ref		Ref		Ref		Ref		Ref	
25-49	0.83	0.75	0.65	0.48	0.33	0.51	0.43	0.50	2.14*	0.89	0.32	0.54
50-99	1.92	1.02	1.47*	0.66	0.78	0.69	1.51*	0.67	3.84**	1.16	0.98	0.75
100 or more	3.16*	1.53	2.66	1.06	1.44	1.09	2.68*	1.13	4.99**	1.60	2.17	1.15

Abbreviation: Ref, Reference; SE, Standard Error.
*$P < .05$, **$P < .01$, ***$P < .001$.

points higher than that of medical institutions with fewer than 25 specialists and shown statistically significant ($P = .0394$).

Discussion

This study substantiated the positive correlation between high-tech medical equipment, specifically CT, MRI, and PET scans, in medical institutions and the overall doctor, hospital environment, and patient rights dimensions of patient experience evaluation outcomes. Notably, there was a difference of more than 2 points in the hospital environment and overall dimension, indicating that the technical factor of having high-tech medical equipment had a relatively significant association with the patient's overall experience and environmental factors during their stay. This trend is similar to previous research that reported a relationship between changes in hospital environment scores and overall scores.[20] Additionally, there is a growing trend to utilize medical imaging technology to improve patient experience, the quality of medical services, and accessibility.[21] This aligns with the findings of the present study, which suggest a connection between technical and emotional factors.

In relation to patient experience evaluation results, previous studies have reported that inpatients tend to place importance on physical factors such as the possession of advanced high-tech medical equipment, facilities, and environments.[22] Additionally, studies have indicated that patients tend to choose medical institutions with advanced high-tech medical equipment and superior treatment facilities.[23] These findings are consistent with the positive association between high levels of high-tech medical equipment and patient experience evaluation. Studies have also shown that the level of medical services, such as facilities and equipment, positively affects patient satisfaction.[24] Having expensive medical equipment such as CT scanners also has a positive effect on the overall satisfaction dimension of patient experience evaluation,[7] which is similar to the

trends observed in this study. Hospitals and clinics typically possess CT and MRI scans, whereas approximately 85% of tertiary hospitals and higher-level medical institutions have PET scans.[25] Considering this context, the patient's experience was likely positively influenced not by the mere possession of PET scans but by the overall treatment environment and service quality of hospitals with sufficient resources and a good environment for PET scans. Therefore, interpretations should extend beyond the direct effect of a PET scan to include the role of the medical institution's resources and environment in patient satisfaction and experience. This implies that high-tech medical equipment symbolizes technical aspects and patients' perceptions of the medical institution's quality and reliability.

In addition to the level of high-tech medical equipment, this study examined the relationship between the characteristics of medical institutions, such as the type of medical institution, establishment type, location, establishment duration, affiliation with a medical school, number of beds, number of specialists, and patient experience. The results revealed varying relationships between the different dimensions of patient experience evaluation and type of medical institution, establishment type, establishment duration, and number of specialists. Most previous studies have analyzed the relationship between the characteristics of medical institutions and patient experience evaluation results to identify factors affecting patient satisfaction with the use of medical institutions. This study further considered the level of high-tech medical equipment as a variable of interest, focusing on the relationship between technical and emotional factors.

This study had several limitations. First, this study conducted a patient-experience evaluation–the dependent variable–on adult inpatients, which may not accurately reflect the satisfaction of pediatric patients or outpatients with medical services. As the Ministry of Health and Welfare conducts annual medical service experience evaluations for outpatients, future research in this area is warranted. Second, this study examines the technical factors of medical institutions from the perspective of medical equipment. The technical factors of medical institutions can encompass various aspects, such as facilities and infrastructure, and future research should consider these diverse elements when considering technical factors. Third, Patient experience assessment has been carried out by HIRA since 2017. We have employed the most recent data from the 2021 third wave, which is accessible on the HIRA website. Future research adopting a longitudinal perspective that includes data from the first to the third evaluations is necessary. Fourth, this study evaluated patient experience in general and tertiary hospitals, limiting the applicability of the findings to other hospital-level institutions. Fifth, the data limitations prevented us from conducting more in-depth analyses. To better understand how expensive medical equipment affects patient experience, future studies should include more tests such as propensity score matching, examine patients who received treatment using expensive medical equipment, or examine medical institutions other than tertiary hospitals. Despite these limitations, this study is significant in that it focused on the levels of representative high-tech medical equipment—CT, MRI, and PET scans—unlike previous studies. It confirmed the relationship between medical equipment and medical institution characteristics and the experiences of patients in terms of the responsiveness of the healthcare system as perceived by patients during treatment[26] and the use of medical equipment as tools in medical practice.

Conclusion

In today's medical institutions, the concept of care has expanded to include the treatment of a patient's illness and a patient's overall experience when visiting a medical facility. This study examined the relationship between the technical factors of high-tech medical equipment in medical institutions and the emotional metric of patient experience evaluation, which quantifies patients' psychological satisfaction. These findings suggest that when formulating patient care policies, medical institutions should consider both the technical and emotional aspects of healthcare.

Acknowledgments

None applicable.

Contributions

S.M.O. designed the study, interpreted the results, and drafted the manuscript; J.S.P. acquired the data, performed the statistical analyses, interpreted the results, and drafted the manuscript; B.K performed the statistical analyses, and drafted the manuscript; S-Y.J interpreted the results, and critically reviewed the manuscript; S.G.L. critically reviewed the manuscript; and T.H.K. conceptualized the study, designed the study, and supervised the whole study process. All authors read and approved the final manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics Approval

The data are available on request from the Health Insurance Review & Assessment Service.

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Informed Consent

This study was exempt from ethical review and approval as it utilized secondary data.

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Statements and Declarations

Not applicable.

Consent for Publication

Not applicable.

Supplemental Material

Supplemental material for this article is available online.

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