ORIGINAL RESEARCH

Experiences and perspectives on patient-centered education of medical students in Korea

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Purpose: This study analyzed the current status of and correlations between Korean medical students' experiences and perspectives surrounding patient-centered medical education (PCME).

Methods: A structured PCME questionnaire composed of three categories, understanding patients within social and cultural contexts, understanding patients' individual health contexts through communication, and placement of patients at the center of medical education, was used. The students were stratified into pre-medical (Pre-med), medical (Med), and policlinic (PK) groups because of curriculum differences by grade. The χ^2 test was applied to analyze the association between students' experiences with and perspectives on PCME. A Cramer's V of 0.200 was considered a large effect size for any association between experiences with and perspectives on PCME.

Results: Among the respondents, 50.6% answered that they did not know about patient-centered medicine before the survey. With increasing school years went up from Pre-med to PK, fewer students agreed that PCME should be added to pre-clinical medicine curricula ($p<0.001$), that patients should be in the center throughout medical education ($p=0.011$), and that patients' personal histories, values, and objectives are important PCME ($p=0.001$). Students who said they learned PCME for each category were more likely to consider PCME important (Cramer's V was 0.219 and 0.271 for "with," and "for the patients" respectively, $p<0.001$ for "about/with/for the patients"). Students in all groups chose clinical practice as the best method for PCME ($p=0.021$). Med group chose the lectures as the most effective tool to learn about the importance of communication ($p<0.001$).

Conclusion: Students who experienced PCME were likely to perceive PCME as important and it showed that experiences of PCME had positive effects on PCME perceptions. Despite students' preferences for clinical practice as the best method for PCME, PK reported that they did not learn PCME, and regarded PCME as less important compared to students at earlier stages of their medical education. Therefore, more intensive and holistic PCME curricula rather than only clinical practice exposure may be necessary.

Key Words: Patient-centered care, Patient-centered medicine, Medical education, Republic of Korea, Patient-centered medical education

Introduction

Patient-centered medicine (PCM) has been an important part of healthcare since its appearance in 1969 [1]. The practice can be characterized as "patient involvement in care and the individualization of patient care" [2]. Patients are reportedly highly satisfied when their physicians were patient-oriented [3] and communication between patients and physicians appears to improve

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patient health [4]. As PCM has been emphasized, there have been many global attempts to integrate PCM into medical education [5,6]. The General Medical Council in the United Kingdom prioritizes PCM in medical education, stating to "treat patients as individuals and respect their dignity" and "work in partnership with patients" [7]. Medical schools in the United States have also developed curricula to teach PCM [6,8]. A sociological curriculum for medical students focuses on patient social forces such as family, education, employment, and inequalities in clinical contexts [9]. Programs in which medical students visited the homes of patients have been also implemented, to foster an appreciation of the psychosocial contexts of illnesses beyond clinical settings [10,11]. Volunteer patient-family advisors have been included as important story providers and discussion facilitators in medical school curricula [6].

In accordance with global endeavors to enhance the quality of medical education by focusing more on PCM, Korean medical schools have started to provide educational courses on professional behavior, ethics, and communication skills [12]. With the introduction of clinical performance examination into the Korean medical licensing examination in 2009, PCM was formally incorporated into medical education [13]. In addition, the Accreditation Standards of Korean Institution of Medical Education and Evaluation 2019 (ASK 2019), which all medical schools in Korea use as the basic standards for education, stipulate that respecting patients and guardians, effective communication, and monitoring patient participation in treatment should be taught [14]. However, although some resources have been devoted to improving patient-centered medical education (PCME), particularly regarding communication skills and empathy [15], a holistic approach to PCME remains to be insufficient [16]. In contrast to the United Kingdom and the United States, there are few authentic patient-centered curricula or programs in Korea and unified PCME curricula among Korean medical schools are immature. Only 17 out of 41 medical schools (now, a total of 40 medical schools) have adopted patient-centered care as an educational objective [17]. Although the community-based medical education program in Korea was developed in 2018 [16], it still does not focus on holistic patient-centeredness.

When developing educational curricula, recognizing the attitudes of students themselves is necessary since these are likely to influence student engagement with planned educational activities [18]. Similarly, to implement authentic PCME, the current educational experiences and perspectives on PCME should be considered, especially with respect to medical students. This study aimed to investigate the experiences and perspectives of medical students regarding PCME. Furthermore, we tried to analyze the correlations between PCME experiences and student perspectives since this information might be helpful for further developing PCME programs. This study divided each medical school's PCME curriculum into three categories (about, with, and for patients) referring to the proposed definition for PCME [7].

Methods

1. Study settings

The study was conducted by the Korean Medical Students Association (KMSA), which is the official representative organization of the students at all 40 medical schools in South Korea. A structured questionnaire was developed and distributed by KMSA through a Google online survey from November 17 to November 27, 2020. A total of 604 students replied. After excluding two students who responded in duplicate and one student who refused to provide written consent, 601 medical students

(222 female students and 379 male students) from 39 medical schools were enrolled in this study. This study was approved by the Institutional Review Board (IRB) of The Catholic University of Korea (IRB approval no., MC21EASI0021). The requirement for informed consent was waived by the IRB. The authors confirmed that all methods were performed in accordance with the principles of the Declaration of Helsinki and current scientific guidelines.

Korean medical schools should be certified through evaluation by the Korean Institution of Medical Education Evaluation, ASK 2019. Therefore, the curricula of medical schools in Korea are standardized to some extent. Most Korean medical schools adopt undergraduate courses with 2 years of pre-medical course and 4 years of medical course. Some adopt 4 years of master's courses, but most of them are switching to the 6-year undergraduate program. A few undergraduate medical schools have adopted integrated 6-year medical courses, which do not separate pre-medical courses and medical courses.

2. Study design and questionnaire

This study was a cross-sectional, survey-based observational study. A self-reported structured questionnaire for assessing experiences with and perspectives on PCME among medical students was developed according to publications proposing the concept of PCME [7,19]. Two independent focus group interviews, one with Kangwon University students and another with KMSA medical education department members respectively, were conducted to develop the items for the questionnaire. The interviewees were asked to have an open discussion on the prepared topics. The prepared topics were "about the patients," "with the patients," and "for the patients." Questions "about the patients" dealt with how patients' socioeconomic status (SES), ethnicity, and health equity are related to medicine. "With the patients" was concerned with the importance of communicating with patients and how much patients' personal history, values, goals, and relationships can affect wellness. "For the patients" questions addressed the issue of whether patients should be at the center of medical education. Each factor of PCME was assessed in terms of experiences and perspectives. Questions on experiences sought subjective responses about whether the participants were properly educated in PCME in medical school. Questions on perspectives dealt with how much the participants valued each PCME factor.

A structured questionnaire was developed, which was composed of five sections using multiple-choice questions based on the two consecutive focus group interviews. Responses to the questions were rated on a 4-point forced Likert scale, which ranged from "strongly disagree" (1 point) to "strongly agree" (4 points), to eliminate neutral options and make the subjects think about the questions. The first part consisted of questions asking about the participants' baseline characteristics. There were three parts related to "about the patients," "with the patients," and "for the patients" asked about experiences with and perspectives of PCME. The last section consisted of a comprehensive survey of PCME. Because we used the newly proposed definition of PCME [7], brief explanations of each category were given in the questionnaire. The internal reliability of the questionnaire was evaluated using Cronbach's α coefficient. Cronbach's α was 0.809 and 0.750 for PCME experiences and perspectives, respectively.

3. Data analysis

Because the survey was based on a cross-sectional and self-reported survey, the participants may have answered according to their current situations. Therefore, analyses were conducted by stratifying the participants' grades. Students were stratified into pre-medical (Pre-med), medical (Med), and policlinic (PK) groups because the curriculum

varies from grade to grade. G*Power ver. 3.1.9.7 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany; http://www.gpower.hhu.de/) was used to determine the adequate sample size for the study. For one-way analysis of variance (ANOVA) to detect a medium effect size (Cohen's f=0.25), an estimated sample size of 252 would provide 95% power and a significance level of 0.05 for three groups. For a χ^2 test to detect a medium effect size (Cohen's w=0.3), a sample size of 292 was required to achieve a power of 95% and an α value of 0.05 with nine degrees of freedom. Therefore, we were able to conclude that 601 subjects were sufficient for this study's purposes.

Descriptive statistics were calculated for the baseline characteristics among the subjects and answers related to PCM. Since response to questions on PCME were rated on 4-point forced Likert scale, they were analyzed as continuous variables. Categorical variables are presented as frequencies and percentages, and continuous variables are presented as the mean±standard deviation. Experiences with and perspectives on PCME were compared among students in pre-medical (Pre-med), medical (Med), and policlinic (PK) courses. Differences among the three groups were analyzed using one-way ANOVA and χ^2 tests. In addition, the experiences with and perspectives on PCME of students who were aware of PCM before this study and those who were not were compared using t-tests and χ^2 tests. To analyze of the association between experiences with and perspectives on PCME, a χ^2 test was used. Statistical significance was set to an α value of 0.05. A Cramer's V of 0.200 was considered a large effect size for any association between experiences with and perspectives on PCME. Statistical analyses were carried out using IBM SPSS ver. 23.0 (IBM Corp., Armonk, USA).

Results

1. Background characteristics of the study population and PCM

The average age of the Pre-med group was 20.57±1.76 years, while the Med group was an average of 23.32±2.44 years old, and the PK group was 25.67±3.14 years old. There was no statistical difference in the sex ratio among the three groups (p=0.653). Most of the subjects were in a program that included 2 years of pre-medical courses plus 4 years of medical courses at a medical school (502 subjects), followed by those in an integrated 6-year curriculum (53 subjects) and those in a 4-year graduate medical schools (46 subjects).

When asked "Did you know about PCM before this survey?", 54.3% of the Pre-med group reported knowing little about PCM and 36.2% knew of it well; 46.1% of Med group did not know it well, and 41.9% were familiar with the subject; 41.1% of the PK group had little knowledge of PCM and 48.5% of the PK group reported being familiar with it (p=0.017). In total, 50.6% of all students reported that they had no idea or did not know PCM well. When asked how much PCM should be added to pre-clinical medical education, there was a significant difference between the three groups (p<0.001), but there was no statistical difference among the groups when they were asked what proportion of clinical medicine lectures should be devoted to PCM (p=0.587). The results are summarized in Table 1.

2. Experiences with and perspectives on PCME

1) Experiences with PCME

The results of the survey on experience with PCME are summarized in Table 2 and Table 3, along with per-

Table 1. Background Characteristics of Population Statistics and Patient-Centered Medicine

Characteristic	Pre-med	Med	PK	p-value
Baseline characteristics				
Age (yr)	20.57±1.76	23.32±2.44	25.67±3.14	<0.001
Sex				0.653
Female	80 (36.2)	77 (35.5)	65 (39.9)	
Male	141 (63.8)	140 (64.5)	98 (60.1)	
Medical school type				<0.001
2-Year pre-med+4-year medical school	195 (88.2)	173 (79.7)	134 (82.2)	
Integrated 6-year curriculum	26 (11.8)	19 (8.8)	8 (4.9)	
4-Year graduate medical school	0	25 (11.5)	21 (12.9)	
Characteristics regarding PCM				
Did know about PCM before this survey				0.017
Have no idea of PCM	10 (4.5)	3 (1.4)	4 (2.5)	
Don't know well of PCM	120 (54.3)	100 (46.1)	67 (41.1)	
Knowing well of PCM	80 (36.2)	91 (41.9)	79 (48.5)	
Knowing very well of PCM	13 (5.0)	23 (10.6)	13 (8.0)	
How much proportion of PCM should be added in pre-clinical medicine				<0.001
Don't need to educate PCM in pre-clinical medicine	10 (4.5)	38 (17.5)	36 (22.1)	
PCM added a little	115 (52.0)	120 (55.3)	90 (55.2)	
PCM added more	82 (37.1)	48 (22.1)	27 (16.6)	
PCM centered	14 (6.3)	11 (5.1)	10 (6.1)	
How much proportion of PCM should be added in clinical medicine				0.587
Don't need to educate PCM in clinical medicine	5 (2.3)	8 (3.7)	4 (2.5)	
PCM added a little	84 (38.0)	86 (39.6)	75 (46.0)	
PCM added more	109 (49.3)	105 (48.4)	67 (41.1)	
PCM centered	23 (10.4)	18 (8.3)	17 (10.4)	

Data are presented as mean±standard deviation or frequency (%).
Pre-med: Pre-medical course students, Med: Medical course students before clinical practice, PK: Policlinic students, PCM: Patient-centered medicine.

spectives on PCME. Regarding "about the patients" questions, there were no statistical differences among student groups when asked if they were taught that patients' SES (p=0.483) and circumstances (p=0.052) are important for patient health. However, there was a significant difference among the responses to the question that asked if they were told that a patient's ethnicity is important to their health (p=0.006). The answers from the three student groups showed no differences when it came to questions about health equity experiences (p=0.784).

In the "with the patients" section, Pre-med tended to report higher scores when they were asked if their school teaches that patients' personal history, values, and objectives are important factors in patient health (p=0.013). There was also a significant difference in the average answers in the student groups when asked whether they were taught that patients should be at the center throughout medical education (p=0.011) in the "for the patient" section of the questionnaire. To questions about which year they were taught about each PCME factor, Pre-med tended to answer the first or second year, whereas medical students reported the third or fourth year, and PK students reported the fourth or fifth year (p<0.001).

The results comparing the participants' perception of PCM before this study are summarized in Table 2 and Table 3. Those who were aware of PCM before this study had a tendency to report that they were taught all items included in this study (p<0.001) more often than those who were unaware of PCM before.

Table 2. Experiences and Perspectives of Patient-Centered Medical Education in South Korean Medical Students according to Medical Course Status and Knowledge Status of Patient-Centered Medicine

Variable	Pre-med	Med	PK	p-value	Didn't know PCM	Knew PCM	p-value
Experiences							
"About the patients"							
School teaches "patients' SES" is an important factor for patients' health and health equity.	3.05±0.76	3.06±0.68	2.98±0.68	0.483	2.90±0.73	3.18±0.66	<0.001
School teaches "patients' ethnicity" is an important factor for patients' health and health equity.	2.89±0.83	2.88±0.84	2.64±0.82	0.006	2.65±0.84	2.98±0.80	<0.001
School teaches "patients' circumstance" is an important factor for patients' health and health equity.	3.24±0.70	3.28±0.65	3.12±0.64	0.052	3.08±0.69	3.36±0.62	<0.001
School teaches "health equity" in school	2.85±0.76	2.89±0.77	2.88±0.70	0.784	2.66±0.76	3.09±0.67	<0.001
"With the patients"							
School teaches "patients' personal history and value, objective" is an important factor for patients' health.	3.16±0.68	3.14±0.72	2.96±0.66	0.013	2.87±0.69	3.33±0.62	<0.001
School teaches "how communication with patient" can improve patients' health.	2.85±0.75	3.08±0.70	2.85±0.70	0.001	2.72±0.73	3.16±0.65	<0.001
"For the patients"							
Does the school teach that patients should be in the center throughout medical education?	3.10±0.61	2.98±0.68	2.92±0.56	0.011	2.84±0.62	3.18±0.58	<0.001
Perspectives							
"About the patients"							
Do you think schools should teach more about "health equity"	3.08±0.66	2.86±0.76	2.86±0.81	0.003	3.01±0.71	2.87±0.77	0.015
How important do you think it is to understand "patients' SES" as a doctor?	3.35±0.53	3.35±0.53	3.23±0.56	0.056	3.26±0.53	3.38±0.55	0.004
"With the patients"							
How important do you think it is to understand "patients' special circumstances" as a doctor? (0–5 score)	4.14±0.78	4.08±0.74	3.87±0.86	0.003	3.96±0.80	4.12±0.78	0.011
How important do you think "communication with patient itself" is as a doctor? (0–5 score)	4.40±0.76	4.44±0.76	4.33±0.74	0.347	4.32±0.77	4.47±0.74	0.018
How important do you think it is to understand "patients' personal history and value, objective" as a doctor?	3.28±0.58	3.34±0.53	3.17±0.58	0.013	3.20±0.57	3.34±0.55	0.004
"For the patient"							
Do you think the patients should be in the center throughout medical education, such as curriculum, evaluation, and feedback?	3.20±0.56	3.13±0.63	2.90±0.71	<0.001	3.04±0.65	3.15±0.63	0.043

Data are presented as mean±standard deviation. Didn't know PCM: Answered "have no idea of PCM" and "don't know well of PCM" in the question of "have known about PCM before this survey." Knew PCM: Answered "knowing well of PCM" and "knowing very well of PCM" in the question of "have known about PCM before this survey."
Pre-med: Pre-medical course students, Med: Medical course students before clinical practice, PK: Policlinic students, SES: Socioeconomic status.

2) Perspectives on PCME

The results of the perspectives on PCME are summarized in Table 2. Pre-med group was more likely to report that schools should teach more about health equity than were Med and PK groups (p=0.003). However, there was no difference in what participants thought about how important it is to understand patients' SES (p=0.056). Those who were aware of PCM before were more likely

Table 3. Grades that South Korean Medical Students Experience Patient-Centered Medical Education according to Medical Course Status and Knowledge Status of Patient-Centered Medicine

Experiences according to grades	Grade	Pre-med	Med	PK	p-value	Didn't know PCM	Knew PCM	p-value
"About the patients"								
In which grade the class teaching "SES" was arranged at?	1	104 (47.1)	19 (8.8)	7 (4.3)	<0.001	67 (22.0)	63 (21.2)	0.002
	2	65 (29.4)	37 (17.1)	7 (4.3)		53 (17.4)	56 (18.9)	
	3	14 (6.3)	80 (36.9)	22 (13.5)		51 (16.8)	65 (21.9)	
	4	7 (3.2)	65 (30.0)	52 (31.9)		56 (18.4)	68 (22.9)	
	5	3 (1.4)	4 (1.8)	48 (29.4)		27 (8.9)	28 (9.4)	
	6	1 (0.5)	0	8 (4.9)		5 (1.6)	4 (1.3)	
	No	27 (12.2)	12 (5.5)	19 (11.7)		45 (14.8)	13 (4.4)	
In which grade the class teaching "patients' ethnicity" was arranged at?	1	93 (42.1)	16 (7.4)	4 (2.5)	<0.001	62 (20.4)	51 (17.2)	0.004
	2	62 (28.1)	36 (16.6)	6 (3.7)		48 (15.8)	56 (18.9)	
	3	17 (7.7)	75 (34.6)	17 (10.4)		47 (15.5)	62 (20.9)	
	4	8 (3.6)	59 (27.2)	49 (30.1)		50 (16.4)	66 (22.2)	
	5	3 (1.4)	6 (2.8)	37 (22.7)		24 (7.9)	22 (7.4)	
	6	1 (0.5)	0	8 (4.9)		3 (1.0)	6 (2.0)	
	No	37 (16.7)	25 (11.5)	42 (25.8)		70 (23.0)	34 (11.4)	
In which grade the class teaching "patients' circumstance" was arranged at?	1	103 (46.6)	17 (7.8)	5 (3.1)	<0.001	67 (22.0)	58 (19.5)	0.001
	2	68 (30.8)	35 (16.1)	5 (3.1)		51 (16.8)	57 (19.2)	
	3	16 (7.2)	83 (38.2)	19 (11.7)		52 (17.1)	66 (22.2)	
	4	8 (3.6)	67 (30.9)	60 (36.8)		59 (19.4)	76 (25.6)	
	5	3 (1.4)	7 (3.2)	45 (27.6)		30 (9.9)	25 (8.4)	
	6	2 (0.9)	0	11 (6.7)		7 (2.3)	6 (2.0)	
	No	21 (9.5)	8 (3.7)	18 (11.0)		38 (12.5)	9 (3.0)	
"With the patients"								
In which grade the class teaching "how to communicate with patients" was arranged at?	1	76 (34.4)	6 (2.8)	2 (1.2)	<0.001	46 (15.1)	38 (12.8)	<0.001
	2	60 (27.1)	34 (15.7)	9 (5.5)		48 (15.8)	55 (18.5)	
	3	8 (3.6)	86 (39.6)	23 (14.1)		56 (18.4)	61 (20.5)	
	4	4 (1.8)	74 (34.1)	58 (35.6)		58 (19.1)	78 (26.3)	
	5	11 (5.0)	6 (2.8)	58 (35.6)		32 (10.5)	43 (14.5)	
	6	0	2 (0.9)	7 (4.3)		5 (1.6)	4 (1.3)	
	No	62 (28.1)	9 (4.1)	6 (3.7)		59 (19.4)	18 (6.1)	

Data are presented as mean±standard deviation. Didn't know PCM: Answered "have no idea of PCM" and "don't know well of PCM" in the question of "have known about PCM before this survey." Knew PCM: Answered "knowing well of PCM" and "knowing very well of PCM" in the question of "have known about PCM before this survey."
Pre-med: Pre-medical course students, Med: Medical course students before clinical practice, PK: Policlinic students, SES: Socioeconomic status.

to report that understanding patients' SES is important than those who were not (p=0.004). However, they were less likely to report that schools should teach more about health equity (p=0.015).

In the "with the patients" section, the participants were asked about the importance of patients' special circumstances; communication with patients; and patients' personal history, values, and objectives. The first two questions asked the respondents to score their answers from 0 to 5. All subjects, regardless of the group, provided

Table 4. The Correlations between the Experiences and Perspectives of Patient-Centered Medical Education

Correlations	Group	Cramer's V	p-value
"About the patients": the association between experiences and awareness about health equity	Pre-med	0.166	0.032
	Med	0.181	0.011
	PK	0.209	0.011
	Total	0.157	<0.001
"With the patients": the association between experiences and awareness about patients' personal history, values, and objectives	Pre-med	0.278	<0.001
	Med	0.209	0.004
	PK	0.189	0.041
	Total	0.219	<0.001
"For the patients": the association between experiences and awareness about patient-centered medical education	Pre-med	0.304	<0.001
	Med	0.288	<0.001
	PK	0.286	<0.001
	Total	0.271	<0.001

Cramer's V of 0.200 was considered as large effect size.
Pre-med: Pre-medical course students, Med: Medical course students before clinical practice, PK: Policlinic students.

a score of 4 or higher for the question related to communication (p=0.347). However, the PK group gave significantly low scores to the questions related to patients' special circumstances (p=0.003) and patients' personal history, values, and objectives (p=0.013). In comparing previous awareness of PCM, those who were aware of PCM had a tendency to score higher both in patients' special circumstances (p=0.011) and in communication (p=0.018). These results were consistent with the scores for the question on patients' personal history, values, and objectives (p=0.004).

In the "for the patient" section, Pre-med group was more likely to agree that patients should be at the center, whereas the PK were least likely to agree (p<0.001). In addition, those who were aware of PCM were more likely to agree that patients should be at the center than those who were not (p=0.043).

3. Correlation between experiences with and perspectives on PCME

The association between experiences and perspectives in the questionnaire was analyzed. The results are summarized in Table 4. The correlations were significant for all factors in both the total and subgroup analyses.

In the "about the patients" questions, the correlation was large among PK group (Cramer's V=0.209, p=0.011). Pre-med (Cramer's V=0.278, p<0.001) and Med (Cramer's V=0.209, p=0.004) exhibited a large effect in the "with the patients" section. For the "for the patients" questions, the correlation was significant in all groups (pre-med: Cramer's V=0.304, p<0.001; med: Cramer's V=0.288, p<0.001; PK: Cramer's V=0.286, p<0.001; total: Cramer's V=0.271, p<0.001).

4. Teaching methods that the students thought were best

When asked which method was the best for teaching PCME, the students of all grades chose "clinical practice in which students can directly face patients." PK group chose "clinical practice in which students can directly face patients" more frequently than did Pre-med and Med groups (p=0.021). Significant differences were evident among the three groups when they were asked to choose the most helpful method to learn the importance of

Table 5. Teaching Methods that the Students Thought Were Best

Method	Pre-med	Med	PK	Total	p-value
What do you think of as "the best method to teach patient-centered medicine"?					0.021
Theoretical lecture about the theory and practice of patient-centered medicine	26 (11.8)	28 (12.9)	10 (6.1)	64 (10.6)	
Clinical practice which can directly face patients	118 (53.4)	111 (51.2)	106 (65.0)	335 (55.7)	
Discussion about the cases in which SES and patients' characteristics have affected patients' health	53 (24.0)	67 (30.9)	35 (21.5)	155 (25.8)	
Educations about the society, away from school and hospital	23 (10.4)	9 (4.1)	11 (6.7)	43 (7.2)	
Others	1 (0.5)	2 (0.9)	1 (0.6)	4 (0.7)	
What do you think of as "the most helpful method to learn importance of communication"?					<0.001
Mention of instructors during classes	55 (24.9)	54 (24.9)	20 (21.5)	129 (21.5)	
Lecture about communication between patients and physicians and patients' health	67 (30.3)	60 (27.6)	27 (16.6)	154 (25.6)	
Practice with a standardized patient	7 (3.2)	38 (17.5)	15 (9.2)	60 (10.0)	
Practice with a patient	2 (0.9)	8 (3.7)	57 (35.0)	67 (11.1)	
Discussion class	20 (9.0)	15 (6.9)	14 (8.6)	49 (8.2)	
Community service	9 (4.1)	3 (1.4)	2 (1.2)	14 (2.3)	
Role playing	8 (3.6)	12 (5.5)	11 (6.7)	31 (5.2)	
Read related materials on your own	1 (0.5)	0	2 (1.2)	3 (0.5)	
None	47 (21.3)	23 (10.6)	15 (9.2)	85 (14.1)	
Short answer	5 (2.3)	4 (1.8)	0	9 (1.5)	

Cramer's V of 0.200 was considered as large effect size.
Pre-med: Pre-medical course students, Med: Medical course students before clinical practice, PK: Policlinic students.

communication. Pre-med and Med groups chose "lecture about communication between patients and physicians and patients' health," whereas PK group chose "clinical practice with a patient" ($p<0.001$). The results are summarized in Table 5.

Discussion

Students of all grades chose clinical practice as the most appropriate method for PCME. However, the percentage of students who replied that patients should be centralized in medical education was significantly lower among PK group than Pre-med and Med groups. The clinical practice that the PK experienced was mainly composed of rounding, outpatient clinic observations, preliminary examinations, and case presentations, which covered almost all clinical field. We interpreted this as students who experienced clinical practice might think PCM is not an important issue in the hospital or that PCM is already carried out to some extent. Hafferty [20] proposed the concept of "hidden curriculum," which means that taken-for-granted understandings and customs in training institutions functioned importantly for students beyond their formal curriculum [5]. For example, even though students were taught to ask patients with open-ended questions and listen to patients' personal stories, if PK students encountered closed-ended questions and frequent interruptions by physicians in clinical practice, they could have experienced internal conflicts that decreased the credibility of PCME [21,22]. On the other hand, many students replied that they did not even know what PCM was, and PCME in Korea has been focused on communication skills. So, they might have simply assumed that PCM was just being kind or listening to patients, and felt that PCM was already conducted to some extent, thus they might regard PCME as less important.

Similar aspects can be found in other questions. The

percentages of students who said that PCM should be added to pre-clinical medicine courses, that patients should be in the center throughout medical education, and that understanding patients' personal histories, values, and objectives are important were lower among PK students. In focused group interviews we conducted before the survey, PK group looked at PCME as close to the doctor's point of view, and students who had not experienced clinical practice looked at PCME as close to the patient's point view. Several PK students replied that PCM in actual practice was already carried out because doctors considered the accessibility of their patients or their economic status. Some students who had not experienced clinal practice replied that they felt physicians did not understand their patients well. Our study results were consistent with previous studies that found students became more doctor-centered as they advanced to higher grades [23,24].

There was a tendency of negative answers for experiences and perspectives about PCME as school year went up and differences between PK and Med groups were larger than those between Pre-med and Med groups' answers to several questions. Although perspectives about PCME were difficult to analyze according to educational curricula alone, the consistent pattern of responses among PK students and the tendency that differences between PK and Med groups were larger than that of Pre-med and Med group suggest that clinical practice experiences may be associated with perspectives about PCME. In addition, students who replied that school teaches "about/with/for the patients" were likely to consider PCM important. It suggests that medical education experience may be an important factor in perspectives about PCM among medical students. Therefore, our results show that just being exposed to clinical practice may not lead to an understanding of PCME, which suggests that more intensive intervention for PCME may be necessary.

As the number of school years increased, more students replied that they knew about PCM before the survey. Nevertheless, almost half of the students replied that they did not know PCM well. Such a core curriculum for sociology in medical students in United Kingdom [9] and classroom education on the theoretical foundation of communication in United States [6] indicate that developing and conducting an intensive PCME curriculum may be necessary for education. Med group was most likely to answer that they learned how communication can improve patients' health and they chose "lectures about communication" and "mention of instructors about communication" as more helpful than "practice with standardized patients." Previous studies also showed that students had a tendency to depend on teachers' feedback [25,26]. Therefore, developing PCME curricula, including lectures and the feedback of instructors, may be helpful because students often have little understanding of the concept of PCME.

Additionally, students tended to choose recent years as when they have learned each component of PCME. We assumed that this was due to forgetting and the absence of crucial PCME programs, which would not be forgotten. Further the development of PCME teaching methods, including discussions and visual and auditory materials [26,27], may be essential because most medical students might not have experienced various types of PCME education rather than lectures. Active assignments such as writing that portray family dynamics in the illness may help to understand the cross-cultural issues of diseases [28]. Patients' home visit programs have been conducted in several medical schools in United Kingdom and United States and were reported highly satisfactory by medical students with respect to PCME [6,10]. In "About the patients," educational experiences on patients' ethnicity were less common than those on patients' SES and circumstances, which it may be the result of less emphasis on racial differences in Korean medical education. Thus,

the balanced components in PCME, such as patients' SES, ethnicity, and circumstance, are also needed. Since Pre-Med was shown to be more patient-centered than PK, early intervention in pre-medical curricula may need to be considered, too.

Other studies also showed the necessity of PCME intervention. When Sohn et al. [29] compared patient-centeredness among faculties, residents, and medical students, they found that groups that attended PCM lectures had more patient-centered attitudes. Moon et al. [30] also claimed the necessity of lectures on patient-physician interactions. Other studies used a patient-practitioner orientation scale or patient-physician interaction guidelines to evaluate students' attitudes toward patients [3,23,24]. However, we used autonomously developed questions to allow for close correlation with PCME definitions and educational experiences. Therefore, this study covered more wide range of PCME that include not only communication between patients and physicians, but also sociocultural contexts of patients and involvement of patients in the center of medical education.

Students did not know about PCM before this survey. However, students who experienced PCME were likely to perceive PCME as important, showing that experience with PCME had positive effects on the perception of PCME. Despite students' preferences for clinical practice as the best method for PCME, PK group reported that they did not learn about PCME and regarded PCME as less important compared to students at earlier stages of their medical education. Therefore, more intensive interventions for PCME may be necessary because just being exposed to clinical practice did not appear to be an effective PCME tool. Various methods can be considered. The development of PCME curricula including theoretical classroom lectures may be effective. This study also suggested the necessity of reflecting that actual practice has been truly patient-centered to educate students. For the further development of PCME, an academic consensus on the definition of PCME and unified PCME curricula among medical schools may also be needed.

This study had some strengths. This was the first study on PCME from the perspective of medical students. Also, this study was conducted thoroughly by medical students so that the study could well reflect students' points of view. In addition, because all medical schools in Korea were enrolled in this study, we could determine the medical students' experiences with and perspectives on PCME that were not limited to specific educational backgrounds and thus, could be nationally generalizable.

Having said that, there were some limitations in this study. A more precise comparison of schools' curricula and students' subjective PCME experience is necessary to evaluate the effect of education. As the present study included most medical schools in Korea, there was an imbalance among participants from each school. A qualitative study may also be helpful. Furthermore, since this was a cross-sectional study, some biases such as cohort effect and recall bias might have affected the study results, so a longitudinal study is needed to confirm our results. In addition, further studies to determine the cause of the differences in views on PCME not only by grades, but also by other factors such as individual changes and personalities, are also necessary.

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