

# Correlation between medical student empathy and a Korean nationwide comprehensive clinical assessment score at a medical school in Korea

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## Research Article

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## Abstract

**Background** Empathy represents the ability to understand and communicate a patient's situation, perspective, and feelings and, when demonstrated by healthcare professionals, can increase patient adherence, satisfaction, and treatment outcomes. Empathic students have stronger affective skills and can acquire, develop, reinforce, and display strong affective behaviors, abilities, and attitudes.

**Methods** We measured student empathy using the Student Version of the Jefferson Scale of Empathy (JSE-S) and assessed 3-year sequential clinical comprehensive assessment scores conducted by the Korean Medical Education Assessment Corporation to determine the relationship between JSE-S and clinical comprehensive assessment scores.

**Results** This study population comprised 80 males (74%) and 28 females (26%). Thirty-eight students (35%) wanted to be private physicians and 62 (57%) attending faculty. Medical fields were common future majors for 58 students (54%). Surgical fields were considered by 40 students (37%). However, no significant differences in Korean JSE-S were observed according to medical student gender, career aspirations, or future major fields.

## Introduction

Empathy is the ability to understand and communicate a patient's situation, perspective, and feelings.[1] Empathy plays an important role in a positive physician–patient relationship. In addition, patient satisfaction contributes to optimal clinical outcomes.[2] Therefore, medical education has always valued empathy as an essential professional attribute of physicians.[3] However, recent studies have found that empathy scores decline in medical school.[4] Unfortunately, current medical education focuses more on detachment and objectivity than on the relationship with patients.[5]

The Student Version of the Jefferson Scale of Empathy (JSE-S) was specifically developed as a self-reported scale for assessing empathy in medical students.[6] The JSE-S includes 20 items that measure three underlying empathy constructs (perspective taking, compassionate care, and standing in patient's shoes) that have proven to have good psychometric properties.[7–9] In South Korea, the Korean Student Version of the Jefferson Scale of Empathy (Korean JSE-S) is used to measure empathy toward patients.[10, 11]

This study aimed to determine the relationship between Korean JSE-S and clinical comprehensive assessment scores from the Medical Education Assessment Corporation.

## Participants And Procedures

A total of 108 medical students in South Korea participated in this cross-sectional study conducted in May 2020. Study participants were 6th-year medical students enrolled in the 6-year medical course at Kyungpook National University School of Medicine (KNUSM). We also assessed future career aspirations. The response rate was 99%. Demographic data of all students and responders are presented in Table 1. Clinical comprehensive assessments were performed four times in November 2018 and 2019 and August and December 2020. This study was approved by the Institutional Review Boards of Kyungpook National University. All methods were carried out in accordance with relevant institutional and national guidelines and regulations for human research standards. Informed consent was obtained from all participants, who were over 16 years of age.

Table 1  
Basic characteristics of the participants

Characteristic		Frequency (%)	JSE-S score*
Sex	Man	80 (74.1)	92.7 ± 14.4
	Woman	28 (25.9)	91.2 ± 12.0
Career aspirations	Private physician	38 (35.2)	93.7 ± 13.5
	Attending faculty	62 (57.4)	91.7 ± 13.7
	Others	8 (7.4)	89.8 ± 16.3
Future major	Medical	58 (53.7)	90.0 ± 13.2
	Surgical	40 (37.0)	95.3 ± 14.0
	Others	10 (9.3)	93.6 ± 14.8
JSE-S, Jefferson Scale of Empathy-Student version.			
*Mean ± SD			

The medical curriculum at KNUSM comprises 3 years of preclinical work followed by 3 years of clinical work. Major clinical rotations are scheduled during the 5th year and minor clinical rotations during the 6th year. The curriculum at KNUSM is typical of most medical schools in South Korea and similar to those in the United States and Canada. However, unlike the United States and Canada where medical schools are graduate schools, most Korean medical schools are undergraduate schools. A 4-year medical curriculum is preceded by a 2-year premedical course, totaling 6 years of medical training. Therefore, Korean medical students are likely to be younger than US/Canadian medical students.

### Study Questionnaire

The Korean JSE-S was used to measure physician empathy [10, 11]. A standard back-translation procedure was performed. The JSE-S was translated into Korean and then back-translated into English. Korean and English language specialists reevaluated the accuracy of the translation. The Korean-translated version was a self-reported questionnaire consisting of 18 items with a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Eight reverse items were scored from 1 (strongly agree) to 7 (strongly disagree). The original version has 20 items. However, 2 (items 18 and 19) were excluded in this measurement tool as they were considered inappropriate for cultural reasons, resulting in 18 items.[12] The total score was obtained by summing all items (maximum score = 126), where higher values indicated higher degrees of empathy.

We evaluated 3-year sequential clinical comprehensive assessment scores from written tests, with similar results to the Korean Medical Licensing Examination. The comprehensive assessment consisted of 109 physician encounter situations. These dealt with jaundice, chest pain, abdominal discomfort, headache, vaccination, weight loss, diarrhea, constipation, menorrhagia, and other clinical presentations. The examination was taken in the 4th, 5th, early-6th, and late-6th years of the medical course.

### Statistical Analyses

Mean scores of the JSE-S were compared using ANOVA or independent t-test. In cases of significance following ANOVA, post-hoc comparisons were analyzed using the Tukey–Kramer method. Correlations between empathy and comprehensive assessment results were calculated by Pearson's correlation coefficient. Tool reliability was evaluated by Cronbach's alpha. SAS 9.4 (SAS Institute Inc., Cary, NC, USA) was used for statistical analyses. P-values less than 0.05 were considered statistically significant.

## Results

This study population comprised 80 males (74%) and 28 females (26%). Thirty-eight students (35%) wanted to be private physicians and 62 (57%) attending faculty. Medical fields were common future majors for 58 students (54%). Surgical fields were considered by

40 students (37%). However, no significant differences in Korean JSE-S were observed according to medical student gender, career aspirations, or future major fields (Table 1).

The modified Korean version of the JSE-S has 18 items.[12] However, it also has the three components, “perspective taking,” “compassionate care,” and “standing in patient’s shoes.” Perspective taking includes items 2, 4, 5, 9, 10, 13, 15, 16, 17, and 20. Compassionate care is composed of items 1, 7, 8, 11, 12, and 14. Items 3 and 6 represent “standing in patient’s shoes.” The three-component Korean JSE-S is not different according to the basic characteristics (Table 2).

Table 2

Each component’s scores of the Korean Student Version of the Jefferson Scale of Empathy according to the basic characteristics

Characteristic		Standing in patient's shoes			Compassionate care			Perspective taking			Total		
		Mean ± SD	t/F	p	Mean ± SD	t/F	p	Mean ± SD	t/F	p	Mean ± SD	t/F	p
Gender	Man	8.4 ± 2.3	-0.92	0.362	30.1 ± 6.3	1.08	0.283	54.3 ± 8.5	0.25	0.8	92.7 ± 14.4	0.49	0.627
	Woman	8.8 ± 2.4			28.6 ± 6.1			53.8 ± 8.1			91.2 ± 12.0		
Career aspirations	Private physician	8.7 ± 2.4	0.98	0.379	30.3 ± 6.0	0.33	0.722	54.7 ± 8.8	0.4	0.674	93.7 ± 13.5	0.37	0.692
	Attending faculty	8.2 ± 2.3			29.4 ± 6.5			54.1 ± 7.9			91.7 ± 13.7		
	Others	9.3 ± 2.3			28.8 ± 5.2			51.8 ± 10.1			89.8 ± 16.3		
Future major	Medical	8.3 ± 2.2	0.44	0.648	28.7 ± 6.1	2.02	0.138	53.0 ± 8.2	1.26	0.289	90.0 ± 13.2	1.82	0.167
	Surgical	8.7 ± 2.5			31.2 ± 5.4			55.3 ± 8.2			95.3 ± 14.0		
	Others	8.7 ± 2.8			28.8 ± 9.2			56.1 ± 9.9			93.6 ± 14.8		

Item-total score correlations and Cronbach's alpha evaluated the internal consistency reliability of the scale. The reliability of the Korean JSE-S was 0.910 by Cronbach's  $\alpha$  coefficient (Table 3), and the level of reliability was acceptable.

Table 3  
Item-total score correlation of the Korean Student Version of the Jefferson Scale of Empathy

Cronbach Coefficient Alpha		Raw		0.901
		Standardized		0.91
Cronbach Coefficient Alpha with Deleted Variable				
Deleted Variable	Raw Variables		Standardized Variables	
	Correlation with Total	Alpha	Correlation with Total	Alpha
Item 1	0.322	0.908	0.312	0.913
Item 2	0.628	0.894	0.653	0.903
Item 3	0.547	0.896	0.53	0.907
Item 4	0.652	0.893	0.673	0.903
Item 5	0.405	0.9	0.427	0.909
Item 6	0.303	0.903	0.276	0.914
Item 7	0.627	0.893	0.602	0.905
Item 8	0.66	0.892	0.639	0.904
Item 9	0.682	0.892	0.704	0.902
Item 10	0.591	0.894	0.619	0.904
Item 11	0.692	0.891	0.668	0.903
Item 12	0.643	0.892	0.621	0.904
Item 13	0.807	0.889	0.829	0.898
Item 14	0.205	0.906	0.192	0.916
Item 15	0.479	0.898	0.497	0.908
Item 16	0.742	0.891	0.769	0.9
Item 17	0.667	0.892	0.689	0.902
Item 18	0.6	0.894	0.629	0.904

Female students had better scores ( $48.6 \pm 6.5$ ) than males ( $45.9 \pm 9.3$ ) in the 4th year. Female students also had better scores ( $64.2 \pm 8.4$ ) than males ( $62.7 \pm 9.5$ ) in the 5th year. Female students had better scores ( $78.9 \pm 9.4$ ) than males ( $77.0 \pm 8.8$ ) in the early 6th year and had better scores ( $78.0 \pm 9.3$ ) than males ( $76.0 \pm 8.2$ ) in the late 6th year. Students who wanted to be an attending faculty had better scores than others who wanted to be a private physician when they were in their 4th year ( $47.9 \pm 8.7$  vs.  $45.0 \pm 7.1$ ), 5th year ( $63.8 \pm 8.6$  vs.  $62.3 \pm 9.2$ ), early 6th year ( $78.3 \pm 8.1$  vs.  $77.5 \pm 9.0$ ), and late 6th year ( $77.4 \pm 7.8$  vs.  $76.2 \pm 8.2$ ); however, these findings did not reach statistical significance. Students who aspired to work in the medical field ( $65.6 \pm 8.8$ ) had significantly higher scores than students who aspired to work in the surgical field ( $60.4 \pm 8.2$ ) when they were in their 5th year ( $p < 0.01$ ). This trend was also seen in the 4th year ( $48.0 \pm 9.0$  vs.  $44.9 \pm 8.2$ ), early 6th year ( $79.1 \pm 8.1$  vs.  $75.5 \pm 8.6$ ), and late 6th year ( $78.3 \pm 8.5$  vs.  $74.8 \pm 7.7$ ); however, these findings did not reach statistical significance except for the 5th year results. Every student had a better comprehensive assessment after studying the medical curriculum between the 4th and 6th years (Table 4). Students interested in medical fields achieved a better result than those interested in surgical or other fields.

Table 4  
Korean nationwide clinical comprehensive assessment results according to basic characteristics

		4th year			5th year			Early 6th year			Late 6th year		
		Mean ± SD	t/F	p	Mean ± SD	t/F	P	Mean ± SD	t/F	p	Mean ± SD	t/F	p
Gender	Man	45.9 ± 9.3	-1.69	0.096	62.7 ± 9.5	-0.73	0.467	77.0 ± 8.8	-0.94	0.35	76.0 ± 8.2	-1.06	0.291
	Woman	48.6 ± 6.5			64.2 ± 8.4			78.9 ± 9.4			78.0 ± 9.3		
Career aspirations	Private physician	45.0 ± 7.1	1.68	0.191	62.3 ± 9.2	0.5	0.609	77.5 ± 9.0	1.93	0.15	76.2 ± 8.2	1.83	0.166
	Attending faculty	47.9 ± 8.7			63.8 ± 8.6			78.3 ± 8.1			77.4 ± 7.8		
	Others	44.3 ± 14.0			61.4 ± 13.4			71.7 ± 13.9			71.4 ± 13.9		
Future major	Medical	48.0 ± 9.0	1.58	0.21	65.6 ± 8.8	4.83	<b>0.01</b>	79.1 ± 9.1	2.01	0.14	78.3 ± 8.5	2.71	0.071
	Surgical	44.9 ± 8.2			60.4 ± 8.2			75.5 ± 8.6			74.8 ± 7.7		
	Others	45.7 ± 8.4			59.7 ± 11.8			76.5 ± 8.5			73.7 ± 10.0		

The majority of students had positive correlations between the empathy scale and comprehensive assessment results; however, this correlation was not statistically significant. Among female medical students, comprehensive assessment results were inversely correlated with empathy toward the patient; however, this result was not statistically significant (Table 5).

Table 5

Correlation between the empathy and comprehensive assessment results according to basic characteristics

Basic characteristics		School year	Standing in patient's shoes	Compassionate care	Perspective taking	Total
Total		4th	0.025	0.111	0.048	0.084
		5th	0.068	0.145	-0.101	0.016
		Early 6th	-0.013	0.024	-0.093	-0.048
		Late 6th	-0.014	0.029	-0.109	-0.055
Gender	Man	4th	-0.06	0.095	0.09	0.085
		5th	-0.111	0.057	-0.064	-0.031
		Early 6th	-0.09	0.036	0.022	0.014
		Late 6th	-0.123	0.03	0.016	0.003
	Woman	4th	0.309	0.269	-0.115	0.122
		5th	0.626**	0.474*	-0.221	0.22
		Early 6th	0.17	0.018	-0.418*	-0.238
		Late 6th	0.234	0.057	-0.444*	-0.223
Career aspirations	Private physician	4th	0.366*	0.249	0.013	0.184
		5th	0.242	0.302	-0.195	0.049
		Early 6th	0.183	0.066	-0.153	-0.039
		Late 6th	0.242	0.189	-0.069	0.081
	Attending faculty	4th	0.006	0.125	0.164	0.155
		5th	0.049	0.15	0.02	0.092
		Early 6th	0.005	0.084	0.107	0.103
		Late 6th	-0.024	0.043	0.024	0.03
	Others	4th	-0.585	-0.276	-0.363	-0.394
		5th	-0.324	-0.468	-0.364	-0.419
		Early 6th	-0.599	-0.572	-0.836**	-0.783**
		Late 6th	-0.582	-0.65	-0.837**	-0.806*
Future major	Medical	4th	0.095	0.201	0.138	0.195
		5th	0.152	0.254	0.06	0.18
		Early 6th	0.023	0.003	-0.135	-0.079
		Late 6th	0.006	0.042	-0.124	-0.057
	Surgical	4th	-0.193	-0.039	0.013	-0.042
		5th	-0.153	0.049	-0.054	-0.04
		Early 6th	-0.094	0.18	0.108	0.115
		Late 6th	-0.077	0.14	0.082	0.087
	Others	4th	0.654*	0.367	-0.064	0.309

\*: p &lt; 0.05, \*\*: p &lt; 0.01

Basic characteristics	School year	Standing in patient's shoes	Compassionate care	Perspective taking	Total
	5th	0.596	0.31	-0.544	-0.06
	Early 6th	0.298	0.015	-0.317	-0.148
	Late 6th	0.260	-0.010	-0.311	-0.166
*: $p < 0.05$ , **: $p < 0.01$					

## Discussion

The Korean JSE-S appeared worthy unwavering quality and satisfactory factorial validity. [10–13] Factor analyses affirmed that the Korean JSE-S had a three-component figure structure comparative to that of the initial English version.[9] In spite of the fact that the initial version has 20 items; two (items 18 and 19) were not included in the measurement tool used in this study.[12] They were excluded in this measurement tool as they were considered inappropriate for cultural reasons. However, the modified Korean JSE-S had also positive and statistically significant item-total score correlations, showing that the direction of scoring was correct for all items, and each item significantly contributed to the total score. These results illustrate that the Korean JSE-S can be a valuable instrument for surveying empathy in Korean medical students and recognizing significant components for effective empathy education in future researches. A previous study reported a Cronbach's alpha coefficient of 0.84.[10] This study found a Cronbach's alpha coefficient of 0.910 showing reliability despite including 18 items.

The JSE-S scores of Korean medical students were lower than those of American, Mexican, and Polish students.[9, 14] Cross-cultural differences in standards, ethnicity, devout convictions, and sex stereotyping can influence empathic engagement amid clinical situations. Asians are detailed to have a more collectivistic and less individualistic social culture than Westerners.[15] Physicians in Asia tend to expect a more paternalistic part within the physician–patient relationship. Such sociocultural characteristics that extend to general medical practice in Asia may contribute to patients being less self-assured and physicians being more dictator, along these lines maintaining a less patient-centered and empathic approach by physicians. Previous studies have proposed that individual medical college cultures can also influence medical students' empathy.[16] In this study there was no difference with previous study.

Clinical comprehensive assessment scores conducted by the Korean Medical Education Assessment Corporation are typically used to evaluate the ability of medical students to perform physician encounters at every Korean medical institute. The test is held at most Korean medical institutes twice a year. Thus, it represents a well-established, nationwide assessment tool for medical students. However, in this study, written test results did not reflect students' empathy toward patients despite the ability of the test to differentiate talented from underachieving students.

KNUSM is a typical medical school in Korea that demands high student competence, fosters high levels of competitiveness among colleagues, and places a high value on research and charitable care. Such institutional characteristics may have been a contributing factor to the low empathy scores of students enrolled in this study. Indeed, empathy scale results were found to be inversely correlated with the assessment results, particularly among female medical students. This finding may be due to excessive study load, a lack of time, and an educational environment that emphasizes objective and scientific-based thought and reasoning.[1]

Women have greater empathy than men, possibly as they esteem interpersonal relationships and have a more thoughtful understanding of emotions and caring attitude in many studies.[7, 17, 18] Moreover, women outscored men in a US physician study of empathy, in spite of the fact that the difference observed was not statistically significant.[9] There was no difference between female and male medical students in the Polish version.[14] However, the findings of this study, demonstrating female students have lower empathy scores than male students, differ from previous findings, although the difference was not statistically significant.

This study has some limitations. First, the survey was conducted at a single medical school in Korea, which possibly limits the generalization of our results to Korean medical students. However, the medical educational programs in KNUSM is ordinary of most medical schools in South Korea, and our results could be generalized to other Korean medical schools in this aspect. Second, we utilized only a self-rating of empathy. In spite of the fact that the JSE is reported to be well-correlated with observer ratings, self-

reported results may have been subjected to unwitting biases and inconsistencies between self-reflection and actual behavior.[2] Future researches are required to explain the role of cultures and impact of the medical educational programs on empathy.

The findings of this study demonstrate that empathy scale scores do not correlate with clinical comprehensive assessment scores. Every Korean medical institute emphasizes teaching emotional intelligence and skills, which means communicating and sympathizing with one another; however, there is currently a lack of tools for assessing empathy. In these circumstances, a student may neglect the importance of ethics and empathy toward a patient. With medicine becoming increasingly dependent on artificial intelligence, current and future medical students will need to achieve high levels of empathy and emotional intelligence, which cannot be fully comprehended or substituted by artificial intelligence. Accordingly, there is a need to develop assessment tools to evaluate empathy and emotional intelligence among medical students.

## Declarations

### Ethics approval and informed consent

This study was approved by the Institutional Review Boards of Kyungpook National University.

All methods were carried out in accordance with relevant institutional and national guidelines and regulations for human research standards. Informed consent was obtained from all participants, who were over 16 years of age.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that they have no competing interests.

### Funding

Not applicable.

### Data availability statements

The datasets used and analyzed in this study are available from the corresponding author upon reasonable request.

### Authors' contributions

As a corresponding author Min Kyu Jung designed and conducted this study and wrote the entire manuscript. Sanghee Yeo contributed to the study design and assisted with manuscript preparation. Won Kee Lee prepared data tables and performed statistical analyses. All authors reviewed the manuscript.

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