RESEARCH

Assessment of Korean Pharmacy Students' Empathy Using the Jefferson Scale of Empathy

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Objective. To validate the Korean-translated Jefferson Scale of Empathy-Health Professions Student version (JSE-HPS) and to investigate the empathy levels of pharmacy students in South Korea.
Methods. The JSE-HPS and the Interpersonal Reactivity Index (IRI) were administered to 452 pharmacy students in their second and third years at 5 Korean universities. Confirmatory factor analysis (CFA), correlations, and one-way ANOVAs were conducted for data analyses.
Results. The final sample size comprised 447 responses. The 3-factor model of the JSE-HPS was confirmed by CFA and the convergent validity was also supported by its correlations with the IRI subscales. The overall mean score was 80.3. Pharmacy students enrolled in women's or private universities reported significantly higher levels of overall empathy than their counterparts in co-ed or national universities.
Conclusion. Our findings empirically support the psychometric soundness of the Korean JSE-HPS for pharmacy students.
Keywords: empathy, Jefferson Scale of Empathy, pharmacy students, interpersonal reactivity index

INTRODUCTION

Empathy is a vital component in the relationship between health care provider and patient.[1,2] Despite the lack of consensus on a concrete concept of empathy, in patient care situations, empathy can be defined as "a predominantly cognitive (rather than emotional) attribute that involves an understanding (rather than feeling) of experiences, concerns, and perspectives of the patient, combined with a capacity to communicate this understanding."[2] Empathy is significant because it can affect patient health outcomes. Clinician empathy improves both objective and subjective health care outcomes.[3,4] It is positively related to patient confidence in health care professionals and to patient compliance with treatment.[5,6] Empathy is also positively associated with the clinical competence of medical students and with the quality of their patient interactions.[7,8] Empathic physicians tend to make more reasonable medical decisions, and empathy is regarded as a critical element of medical professionalism.[9,10]

The positive effects of empathy on quality medical care suggest that empathy is indispensable to the practice of pharmacy, where patient-centered care and reasonable drug use are crucial matters. The Code of Ethics published by the American Pharmacists' Association requires pharmacists to establish a covenantal relationship with patients to provide care.[11] In general, empathy incorporates understanding patients' concerns, communicating with them, and having the intention to help them.[2,12] It is also considered an important element of pharmacy professionalism in the United States.[13,14] Despite extensive published research focusing on physician empathy, few studies have been conducted in a pharmacy setting and those few studies either assessed empathy scores of pharmacy students or examined effects of empathy education in academic pharmacy.[12,14,15]

A variety of empathy measures have been used in health care professions.[16] Four widely used empathy measures with well-established reliability and validity are the Hogan Empathy Scale (HES), the Questionnaire Measure of Emotional Empathy (QMEE), the Interpersonal Reactivity Index (IRI), and the Jefferson Scale of Physician Empathy (JSPE).[17-20] The measurement object and methodology also vary across the empathy scales. Specifically, the HES and JSPE were designed to assess the cognitive aspects of empathy, the QMEE was developed to tap affective empathy, and the IRI includes both cognitive and emotional empathy. Although all 4 instruments have been used by health care professionals, the HES, QMEE, and IRI were originally designed for the general population,

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rather than specifically for health professionals, whom the JSPE targeted.

Since 2011, the pharmacy school system in Korea has changed from a 4-year program for a BSc to a 2+4 doctor of pharmacy (PharmD) program. The first graduates to complete the new program will graduate in 2015. Students who completed at least the requirement of pre-pharmacy courses (2 years) could take the Pharmacy Education Eligibility Test (PEET). Twenty-nine percent of the first students in the 2+4 pharmacy program in 2011 possessed a bachelor or higher academic degree.[21] More than 85% of working pharmacists who graduated from a 4-year program have worked in community pharmacy or medical institutions in Korea.[22]

The evolution of the Korean educational system was expected to expand the role of pharmacists into patient-centered care. Since empathy is crucial within the context of patient care,[2,12] pharmacy studies should promote the development of empathy during education and training. The empathy demonstrated by pharmacists and pharmacy students has not yet been empirically investigated in South Korea. A reliable and valid instrument for the assessment of empathy is required to identify the effects of empathy on patients' health outcomes and the changes brought about by empathy-enhancing education. However, no empathy measure has been validated in a pharmacy education setting in Korea, even though the Korean versions of 2 empathy measures—JSPE and IRI—were previously validated for Korean medical students.[23,24] The JSPE and JSPE-Student version (JSPE-S) are widely used as context-relevant instruments to measure the empathy of physicians and medical students with regard to patient care.[20] The IRI, however, was developed to measure empathy in the general population. The JSPE shows higher correlations with the subscales of the IRI, which are related to patient care settings (ie, perspective-taking and empathic concern) than with less relevant subscales such as fantasy and personal distress.[25]

A revised version of JSPE, the Jefferson Scale of Empathy-Health Professions Student version (JSE-HPS), was developed to assess students' empathy in health professions other than in medicine. The JSE-HPS survey is validated for health care professions, such as nursing, dentistry, and pharmacy.[12,26-28] Three subconstructs underlying empathy in patient-care situations have been proposed and empirically supported: "perspective taking," "compassionate care," and "standing in the patient's shoes."[29] Specifically, this 3-factor structure was supported in Asian student samples, such as Malaysian pharmacy students[28] and Korean medical students,[23] even though a 2-factor structure emerged from a US pharmacy student sample.[12]

The main purpose of our study was to validate the Korean-translated version of JSE-HPS in pharmacy students by examining its factor structure and its associations with the IRI. In addition, the study investigated empathy levels of Korean pharmacy students and the mean differences in empathy levels in terms of gender, year of study, future career preference, and school type (ie, co-ed vs women's and national vs private).

METHODS

Participants consisted of 452 pharmacy students from 5 universities in South Korea: 2 national co-ed universities ("A" and "B"), one private co-ed university ("C"), and 2 private women's universities ("D" and "E"). Four schools were located in Seoul, and the other ("B") was located in Busan, the second largest city of Korea. The 5 universities had relatively large enrollments and were selected by means of convenience sampling. Indeed, they comprised 25% of all Korean universities providing pharmacy education established before the new 2+4 pharmacy program was launched in 2011. A survey was administered to pharmacy students from 6 classes at the 5 universities: one mandatory class for second-year students from universities A, B, and E, one mandatory class for third-year students from universities C and D, and one elective class for third-year students from university E.

Faculty members in charge of these classes provided permission to administer the survey during their class in advance. Data collection took place one or two weeks after start of the 2013 fall semester and was conducted consistently across the 5 universities. All students who attended any of these classes on the scheduled survey day were invited to participate in this study. Students absent on that day were not included in the study. Before completing their questionnaires, all participants were briefly informed about the purpose of the study and assured that their participation was entirely voluntary and anonymous, and that their survey responses were also private, confidential, and would be used for research purposes only. They completed the survey independently during regular classroom hours. Approval for this work was obtained from the institutional review board (IRB) of university E and from each faculty member in charge of the participating classes.

The survey was designed to validate the adequacy of JSE-HPS among Korean pharmacy students. Permission to translate and use the JSE-HPS was obtained from the Center for Research in Medical Education and Health Care, the Jefferson Medical College, Thomas Jefferson University. The JSE-HPS is slightly different from

JSPE-S. Therefore, the Korean-translated JSPE-S was modified for the Korean-translated version of JSE-HPS by replacing "physician" with "pharmacist" and "medical or surgical treatment" with "the patient's treatment."[23] The scale is composed of 3 subscales that measure perspective taking, providing compassionate care, and standing in the patient's shoes, and these subscales were measured using 10, 8, and 2 items, respectively.

In addition to the Korean-translated JSE-HPS, the survey included the IRI, so its relationship with the JSE-HPS could be examined. The IRI is a multidimensional scale that includes both cognitive and emotional components of empathy. It is composed of the following 4 subscales, each with its own 7 items: (1) perspective taking, (2) empathic concern, (3) fantasy (ie, "respondents' tendency to mentally transpose themselves into the feelings and actions of fictitious characters in books, movies, and plays"[19]), and (4) personal distress. All items were rated on a 7-point Likert scale ranging from "not at all true" to "very true." In previous research, the existing Korean-translated version of the IRI presented evidence of good internal consistency and validity in medical students and general population samples.[30,31] In our study, the internal consistencies for the 4 IRI subscales were 0.75 for perspective taking, 0.81 for fantasy, 0.74 for empathic concern, and 0.76 for personal distress. The survey also included a set of questions to compare mean differences of empathy scores across individual characteristics such as gender, year of study, and preferred future career (options: graduate school, hospital pharmacy, community pharmacy, government service, pharmaceutical industry, and others).

We first computed Cronbach alpha coefficients and the item-total scale correlations using SPSS 18.0 (SPSS, Inc., Chicago, IL) to assess the reliability of the Korean-translated JSE-HPS scale. Cronbach alpha is a coefficient of scale's internal consistency by representing the degree to which all scale items measure the same construct.[32] An alpha coefficient value that exceeds 0.70 is acceptable. For the item-total scale correlations, on the other hand, a cutoff value of 0.40 was used in order to determine whether the item would be eliminated from the scale.

Secondly, we used confirmatory factor analysis (CFA) using AMOS 18.0 (Amos Development Corp., Crawfordville, FL) to assess the measurement model for the 3 latent constructs (ie, perspective taking, compassionate care, and standing in patient's shoes) and to test if the data fit the proposed 3-factor structure of the JSE-HPS. Tests of univariate and multivariate normality of the data were performed to check for the normality assumption for CFA. Several indices were used to evaluate whether the measurement model fit the observed data.

We used a chi-square test to examine the overall fit of the model to the data where a nonsignificant chi-square value indicates that the model adequately describes the sample data.[33] However, since the chi-square statistic is sensitive to the sample size, we included 4 additional indices that measure model fit: the Tucker-Lewis index (TLI), the incremental fit index (IFI), and the comparative fit index (CFI) were used as incremental fit indices; the root mean-square error of approximation (RMSEA) was used as a stand-alone index. The first 3 indices compare the proportionate improvement of the target model relative to the baseline model, with a higher value indicating a better model. Values for all 3 indices in the 0.90 range are acceptable fits for the data.[34,35] On the other hand, a lower RMSEA value indicates a better model; that is, RMSEA values of less than 0.05 reflect a good fit, and values of up to 0.08 are indicative of an acceptable fit.[35,36]

Thirdly, correlation analyses between the JSE-HPS and IRI were performed to assess the convergent validity of the scale. In addition, a series of one-way ANOVAs was conducted to examine for significant differences in students' empathy scores in terms of individual characteristics (ie, gender, year of study, future career preference) and school-wide characteristics (ie, university, co-ed vs women's, national vs private). The significance level was set at .05 for these analyses.

RESULTS

The numbers of enrolled students in classes were as follows: 70 from university A, 68 from university B, 120 from university C, 95 from university D, and 126 from university E. Among those, 452 students attended one of the classes on the scheduled survey day, and the study population included 68 second-year students from university A (n=68/70, 97.1%), 67 second-year students from university B (n=67/68, 98.5%), 112 third-year students from university C (n=112/120, 93.3%), 81 third-year students from university D (n=81/95, 85.3%), and 81 second-year students (n=81/81, 100%) and third-year students (n=43/45, 96%) from university E.

All 452 students invited to participate responded to the survey (n=452/452, 100%). However, 5 students who failed to complete the JSE-HPS survey were excluded from the final sample, resulting in a sample size of 447 (n=447/452, 98.9%). The final sample included 67 students from university A (15.0%), 66 from university B (14.8%), 111 from university C (24.8%), 79 from university D (17.7%), and 124 from university E (27.7%). The sample consisted of 214 second-year (47.9%) and 233 third-year (52.1%) students, and 81 male (18.1%) and 366 female (81.9%) students. In general, the percentage

of male students in Korean pharmacy schools is below 40%. In 2011, the newly admitted pharmacy students consisted of 35% males and 65% females.[21] In terms of school type, the sample included students from co-ed (n=244, 54.6%) and women's (n=203, 45.4%) universities, and from both national (n=133, 29.8%) and private (n=314, 70.2%) universities.

We computed Cronbach alphas and the item-total correlations to examine the reliability of each of the 3 subscales for the Korean-translated JSE-HPS scores. The internal consistencies for the subscales were 0.84 (perspective taking), 0.61 (compassionate care), and 0.69 (standing in the patient's shoes). The item-total correlations of item 2, from the perspective taking subscale, and items 1, 14, 18, and 19, from the compassionate care subscale, were less than the "rule of thumb" cut-off criterion of 0.40. Therefore, these items were dropped from the Korean version of JSE-HPS, resulting in a 15-item scale (Cronbach α=0.84), where 9 items assessed perspective taking (Cronbach α=0.83), 4 compassionate care (Cronbach α=0.71), and 2 standing in the patient's shoes (Cronbach α=0.69). The total scale and subscales of the Korean JSE-HPS demonstrated acceptable reliabilities.

Prior to conducting the CFA, we conducted preliminary analyses to detect the univariate and multivariate normality of the data. All 15 items met the criteria for univariate normality [37] and the skew values were all less than 3 (-1.33~0.38) with kurtosis values all less than 8 (-0.96~3.55). However, Mardia test indicated that the data deviated significantly from normal multivariate kurtosis (z=27.9, $p<0.001$). Because the data were nonnormal in the multivariate distribution, we assessed the overall model fit using a chi-square model test statistic of absolute fit with a Bollen-Stine bootstrap-based p value with 2000 resamples.[38] The CFA results for the measurement model of the Korean version of the 15-item JSE-HPS indicated that the chi-square value for the overall model was significant: χ^2 (87, N=447)=267.7, Bollen-Stine bootstrap $p<0.001$. However, the rest of the fit indices showed an acceptable fit, IFI=0.91, CFI=0.91, RMSEA=0.07 (90% CI: 0.06 to 0.08), even though the TLI value of 0.89 did not meet the conventional adequacy standards. Modification indices indicated that allowing a number of residuals to covary would improve the model fit. Thus, one covariance between the error variances of items 4 and 13 was added to the tested measurement model (Modification index=32.4). This modified model fit the data significantly better than the proposed model did [$\Delta\chi^2$ (Δdf=1, N=447)=33.9, $p<0.001$]. The CFA results showed adequate fit indices where TLI=0.91, IFI=0.92, CFI=0.92, and RMSEA=0.06 (90% CI: .05 to .07), even though the chi-square for the overall model

was significant (χ^2 (86, N=447)=233.72, Bollen-Stine bootstrap $p<0.001$). The standardized path coefficients and the proportion of the variance for each observed variable are presented in Figure 1. All hypothesized factor loadings were in the expected direction and were significant ($p<0.01$). The "perspective taking" and "compassionate care" factors were highly intercorrelated (r=0.76, $p<0.001$), and these 2 factors were slightly correlated with the "standing in the patient's shoes" factor (r=0.17, $p<0.05$ for perspective taking; r=0.23, $p<0.01$ for compassionate care).

The correlations between total scores and the subscale scores of the Korean version of the JSE-HPS and those of the IRI are presented in Table 1. The composite score of the JSE-HPS was positively correlated with perspective taking, empathic concern, and fantasy of the IRI (rs=0.28~0.35, $p<0.001$), but was slightly negatively correlated with personal distress (r=-0.10, $p<0.05$). The perspective taking subscale of the JSE-HPS was positively correlated with perspective taking, empathic concern, and fantasy of the IRI (rs=0.25~0.32, $p<0.001$), but was not significantly correlated with personal distress (r=-0.04, ns). The compassionate care subscale of the JSE-HPS was also associated positively with perspective taking, empathic concern, and fantasy of the IRI (rs=0.21~0.24, $p<.001$), but was not significantly correlated with personal distress (r=-0.09, ns). The standing in the patient's shoes subscale of the JSE-HPS was also positively associated with perspective taking and empathic concern of the IRI (r=0.13, $p<0.01$, r=0.19, $p<0.001$), but slightly negatively correlated with personal distress (r=-0.13, $p<0.01$). The total and subscales of JSE-HPS showed higher correlations with the perspective taking and empathic concern factors of the IRI than with the fantasy and personal distress factors.

The descriptive statistics for the total and 3 subscale scores of the Korean-version of JSE-HPS are presented in Table 2. The overall mean empathy score of Korean pharmacy students was 80.3 (possible range: 15 to 105, SD=8.63). The mean and standard deviations of the overall and 3 subscale empathy scores are presented according to gender, year of study, university, type of university, and future career preference in Table 3, along with a series of F tests. No significant differences emerged across gender, year of study, or future career preference. The differences according to the university were significant for the overall empathy score ($p<0.01$), as well as for perspective taking ($p<0.01$) and for compassionate care ($p<0.01$). A post hoc Scheffé test indicated that university A students reported lower levels of perspective taking than students from the 2 women's universities (D and E, $p<0.05$), and they also showed lower levels of compassionate care
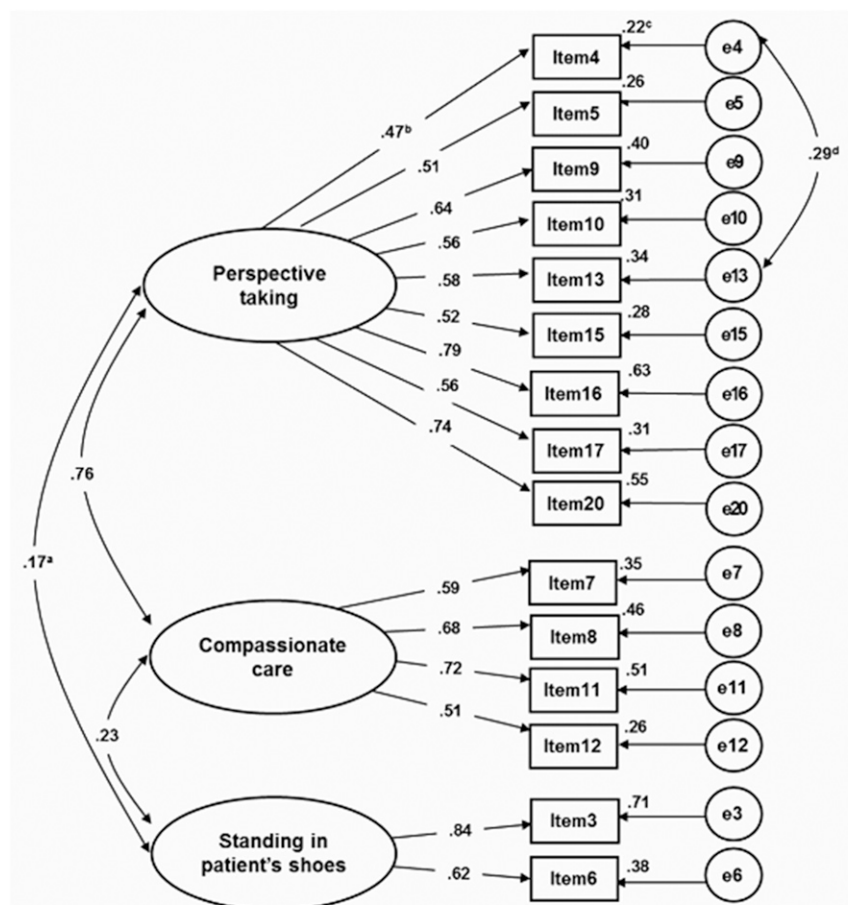
The 3 ovals refer to latent variables, the 15 rectangles are observed variables, and the 15 circles represent measurement errors.
[a] Factor correlation
[b] Standardized factor loading
[c] Proportion of variance explained in the observed variable
[d] Measurement error correlation

Figure 1. Final measurement model of the Korean version of Jefferson Scale of Empathy-Health Profession Student Version (JSE-HPS).

and overall empathy scores than did students from university E ($p<0.05$).

Significant differences emerged for all measures depending on whether students were from women's or co-ed universities, except for the standing in the patient's shoes subscale. Women's university students reported higher levels than students from co-ed universities of perspective taking ($p<0.01$), compassionate care ($p<0.05$), and overall empathy scores ($p<0.01$). However, the effect sizes were small (Cohen d=.29, .23, and .28,

Table 1. Correlation Matrix for the Jefferson Scale of Empathy-Health Profession Student Version (JSE-HPS) with the Interpersonal Reactivity Index (IRI) (n=447)

IRI	JSE-HPS			
	Perspective Taking	**Compassionate Care**	**Standing in Patient's Shoes**	**Total**
Perspective Taking	0.31[c]	0.21[c]	0.13[b]	0.32[c]
Empathic Concern	0.32[c]	0.24[c]	0.19[c]	0.35[c]
Fantasy	0.25[c]	0.23[c]	0.09	0.28[c]
Personal Distress	-0.04	-0.09	-0.13[b]	-0.10[a]

[a]$p<0.05$, [b]$p<0.01$, [c]$p<0.001$

Table 2. Descriptive Statistics of the Korean-translated Jefferson Scale of Empathy-Health Profession Student Version (JSE-HPS) (n = 447)

	JSE-HPS			
	Perspective Taking	**Compassionate Care**	**Standing in Patient's Shoes**	**Total**
Number of items	9	4	2	15
Mean (SD)	49.2 (5.97)	23.3 (2.91)	7.8 (2.26)	80.3 (8.63)
Mode	52.0	24.0	6.0	75.0
25th Percentile	45.0	21.0	6.0	74.0
50th Percentile	49.0	24.0	8.0	80.0
75th Percentile	53.0	25.0	9.0	86.0
Possible range	9~63	4~28	2~14	15~105
Actual range	29~63	11~28	3~14	48~105

respectively). The mean differences in empathy shown between national and private university students were significant for the perspective taking subscale ($p<0.01$) and for the overall empathy score ($p<0.01$). Moreover, pharmacy students enrolled in private universities reported higher levels of overall empathy than did students at national universities, specifically in terms of the perspective taking subscale scores. However, the effect sizes were also small (Cohen d= .31 and .26, respectively).

DISCUSSION

The study aim was to validate the Korean version of the JSE-HPS for pharmacy students in South Korea. Congruent with past research validating the JSPE-S for Korean medical students and the JSE-HPS for Malaysian pharmacy students,[23,28] our findings empirically supported the 3 components of the JSE-HPS for Korean pharmacy students. Unlike in the 2 previous studies, however, 5 items (1, 2, 14, 18, and 19) were dropped from the Korean version of the JSE-HPS because they had low item-total correlation (<0.40). While other items in the subscale for perspective taking described the importance of this aspect in terms of therapeutic outcomes, pharmacists' competency, and pharmacist-patient relationships, item 2 ("Patients feel better when their pharmacists understand their feelings") stressed the patients' feelings rather than the objectives during the treatment process, and thus could be considered a different question compared to other items within perspective-taking. Items 1 ("Understanding the feelings of patients' families") and 18 ("Being influenced by a patients' family") could be seen as awkward circumstances because it is unnatural to recognize and communicate with patients' families in Korea, especially for prescription medications in community pharmacies. Item 19 ("I do not enjoy reading nonmedical literature or the arts") may not have functioned as a significant item to identify empathy in Korean students

because its factor loading was also low in another study with Korean medical students.[23] Items 18 and 19 did not show substantial factor loadings, either in a study with American pharmacy students or in a study with Malaysian pharmacy students.[12,28] On the other hand, item 14 ("I believe that emotion has no place in the treatment of medical illness") had substantial factor loadings on both perspective-taking and compassionate care in research with American pharmacy students.[12] These items had weak psychometric properties (ie, low item-total correlations and low factor loadings) and therefore need to be carefully examined to ensure that they are appropriate for measuring empathy in Korean pharmacy settings.

The present study findings were consistent with past research and empirically supported the convergent and discriminant validity of the Korean JSE-HPS.[25] Although the magnitudes of the correlations between the JSE-HPS and IRI constructs were smaller than those found in a prior study,[25] the results revealed the expected relationship of the JSE-HPS subscales to the IRI subscales; that is, the subscale scores of the JSE-HPS had significant positive associations to perspective taking and empathic concern in the IRI, which are more conceptually and empirically related to empathy in patient-care contexts. In contrast, they showed nonsignificant or trivially negative relationships with personal distress in the IRI, which was found to be a different variable from empathy in patient care.[25]

The present study also assessed the empathy levels of Korean pharmacy students using the Korean version of the JSE-HPS and compared students' empathy levels according to their individual and school characteristics (eg, gender, future career preference, type of school). When indirectly compared to different groups of students participating in previous studies, Korean pharmacy students seemed to have similar empathy scores (overall mean score=80.3, mean item score=5.4) as US pharmacy students (means=5.5–5.7),[12,15] UK pharmacy

Table 3. Mean Differences of Total and Subscales of the Jefferson Scale of Empathy-Health Profession Student Version (JSE-HPS) According to Demographic Factors and Pharmacy School Type (N =447)

	JSE-HPS							
	Perspective Taking		Compassionate Care		Standing in Patient's Shoes		Total	
	M (SD)	F	M (SD)	F	M (SD)	F	M (SD)	F
Gender								
Male (n=81)	50.3 (6.23)	3.58	23.3 (3.25)	0.07	7.9 (2.46)	0.01	81.5 (9.23)	1.89
Female (n=366)	48.9 (5.89)		23.3 (2.83)		7.8 (2.22)		80.0 (8.48)	
Year of study								
2nd (n=214)	48.89 (5.83)	1.79	23.4 (2.76)	0.43	8.0 (2.24)	3.45	80.2 (8.21)	0.05
3rd (n=233)	49.65 (6.09)		23.2 (3.04)		7.6 (2.27)		80.4 (9.01)	
University								
A (n=67)	46.8 (5.60)		22.3 (2.55)		8.0 (2.07)		77.1 (7.53)	
B (n=66)	49.1 (6.47)	4.13[b]	23.7 (2.83)	3.62[b]	7.6 (2.26)	0.42	80.3 (8.69)	3.60[b]
C (n=111)	49.1 (6.27)		22.9 (3.26)		7.8 (2.43)		79.8 (9.39)	
D (n=79)	50.1 (5.92)		23.3 (2.81)		7.7 (2.15)		81.1 (8.84)	
E (n=124)	50.1 (5.31)		23.8 (2.73)		7.9 (2.29)		81.8 (7.91)	
Coeducation								
Women's (n=203)	50.1 (5.54)	9.10[b]	23.6 (2.76)	5.74[a]	7.8 (2.23)	0.00	81.6 (8.27)	8.40[b]
Coeducational (n=244)	48.4 (6.21)		23.0 (2.99)		7.8 (2.29)		79.2 (8.78)	
School type								
National (n= 133)	47.9 (6.13)	9.04[b]	23.0 (2.77)	1.50	7.8 (2.17)	0.00	78.7 (8.25)	6.20[a]
Private (n =314)	49.7 (5.82)		23.4 (2.96)		7.8 (2.30)		80.9 (8.71)	
Future career preference								
Graduate school (n=84)	48.6 (5.75)		22.6 (3.20)		7.7 (2.33)		78.9 (8.39)	
Hospital (n=142)	49.2 (6.20)		23.4 (2.66)		7.7 (2.16)		80.3 (8.57)	
Community pharmacy (n=57)	49.6 (6.60)	0.48	23.4 (3.04)	1.18	8.0 (2.27)	0.66	81.1 (9.28)	0.66
Government service (n=60)	50.0 (5.33)		23.6 (2.66)		7.5 (2.31)		81.1 (7.78)	
Pharmaceutical industry (n=54)	49. (5.53)		23.3 (2.73)		8.1 (2.39)		80.6 (8.44)	
Others[c] (n=50)	48.8 (5.97)		23.5 (3.32)		8.1 (2.25)		80.3 (9.64)	

[a]$p<0.05$, [b]$p<0.01$, [c]Others includes patent attorney, lawyers, entering medical school, etc.

students (means=5.0–5.5),[14] and Korean medical students (mean=5.2).[23] On the other hand, their empathy levels were slightly higher than those of Korean physicians (mean=4.9) and Malaysian pharmacy students (mean=4.2).[28,39] Indeed, Korean physicians' mean empathy score was relatively lower than that of physicians from other countries such as the United States and Italy, possibly as a result of a different medical education culture based on a vertical physician-patient relationship.[39]

The present findings also revealed nonsignificant gender differences, as shown in previous findings with medical students.[15,23] Yet, these results are inconsistent with those of past studies that demonstrated females were more patient-centered and more empathic than their male counterparts.[12,39-41] Despite having no significant gender differences, women's university students showed higher empathy levels than did co-ed university students. Also, the empathy levels of national university students were significantly lower than those of private university students. However, these differences resulted mainly from significantly lower scores from students of university A (a co-ed national university). Roh et al demonstrated that medical students from this university showed lower empathy scores than US medical students did.[23] Those authors suggested that relatively lower empathy scores may have been influenced by the school's top-ranking, which placed more emphasis on high performance. Such a characteristic may be a reason why pharmacy students at this school showed lower empathy scores than those from the 4 other schools. Future research needs to examine whether this pattern would be repeated across pharmacy students of top-ranked schools.

No significant differences emerged by year of study. Previous studies in medicine showed that empathy scores were likely to decline during the third year.[42-44] However, only a few studies examined the changes or differences in pharmacy students' empathy scores, and the results were inconsistent. For instance, the empathy levels of third-year pharmacy students in the UK were significantly higher than those of first-year students,[14] whereas third-year and fourth-year pharmacy students in Malaysia showed lower empathy scores than second-year students.[28] Since the implementation of the 2+4 PharmD program was uniformly applied to the newly admitted students from 2011 in all Korean pharmacy schools, there were no fourth-year students when the survey was carried out. In addition, the first-year students were assumed to have relatively little experience in pharmacy school and were, therefore, not included. However, future researchers should undertake cross-sectional studies to compare empathy levels among Korean pharmacy students in different years of study. Longitudinal studies also need to be conducted to clarify whether there is any change in empathy scores as students advance through pharmacy programs.

Differences in empathy across students' future career preference were not significant. In a medical context, high empathy scores were observed in physicians specializing in psychiatry, internal medicine, pediatrics, and family medicine, where they see patients more often than in anesthesiology, obstetrics and gynecology, radiology, and several surgery areas.[40,45] Among medical students, a specialty oriented toward high technology rather than toward people tended to show lower empathy.[46] Thus, empathy may vary according to the characteristics of the career in the context of pharmacy as well. For example, pharmacists in a community pharmacy might show greater empathy compared to hospital pharmacists who have little opportunity for direct patient contact. Even though no significant mean differences were shown according to the future career preference of pharmacy students in the present study, future studies should clarify if pharmacists' empathy levels vary according to their career field.

The major study findings should be interpreted within the context of the study limitations. First, compared to previous studies that relied only on students from a single institution,[12,14,23] this study included students from various universities in order to increase the generalizability of the findings. Although the 5 universities included in this study were mostly representative of pharmacy schools in Korea in terms of the institution type (ie, national vs private and co-ed vs women's), the present study did not include a representative range of samples from Korean pharmacy students on the basis of gender, year of study, and school characteristics (ie, year of establishment). This may limit the generalizability of our study findings to other schools, such as those established after 2011 or those rurally located. Thus, future studies need to examine whether these findings can be replicated in a more representative sample and to explore whether there is any difference in pharmacy students' empathy as a result of their individual and school characteristics.

The second limitation is related to the empathy measure validated in the present study. Five items were eliminated from the original JSE-HPS scale because they had low item-total scale correlations. A careful analysis should establish if these results can be replicated in other contexts of Korean pharmacy and if the items of the JSE-HPS are adequate in assessing pharmacists' empathy. Furthermore, there were some psychometric limitations of the JSE-HPS in that all items of the compassionate care subscale were negatively worded, and the standing in the patient's shoes subscale consisted of only 2 negatively worded items. These limitations need to be addressed in future work to assess empathy more reliably. Nevertheless, the empirical evidence of the sound psychometric properties validated the potential applicability of the JSE-HSP for use with Korean pharmacy students.

CONCLUSION

The current study demonstrates the JSE-HPS is a reliable and valid measure of empathy among Korean pharmacy students. The validated Korean version of the JSE-HPS will further elucidate the actual empathy level in the pharmacy profession in Korea by assessing pharmacist empathy in a practical manner. As the goal of pharmacy education is to produce excellent pharmacists, significant value will be obtained by conducting further research on pharmacists' outcomes associated with their empathic ability and on the effects of empathy-enhanced education. This validated empathy scale can serve as a tool for such research.

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