RESEARCH ARTICLES

Measuring Empathy in Pharmacy Students

Nancy Fjortoft, PhD,[a] Lon J. Van Winkle, PhD,[b] and Mohammadreza Hojat, PhD[c]

[a]Chicago College of Pharmacy, Midwestern University
[b]Chicago College of Osteopathic Medicine, Midwestern University
[c]Jefferson Medical College of Thomas Jefferson University

Objective. To validate the Jefferson Scale of Empathy-Health Profession Students version (JSE-HPS) in pharmacy students.

Methods. The JSE-HPS (20 items), adapted from the original Jefferson Scale of Empathy for use among students in the healthcare professions, was completed by 187 first-year pharmacy students at Midwestern University Chicago College of Pharmacy.

Results. Two factors, "perspective-taking" and "compassionate care," emerged from factor analysis in this study, accounting for 31% and 8% of the variance, respectively. These factors are similar to the prominent ones reported in previous research involving physicians and medical students, supporting the construct validity of this instrument for pharmacy students. In the current study, mean JSE-HPS score was comparable to those reported for medical students, and consistent with previous findings with medical students and physicians. Women scored significantly higher than men.

Conclusions. Findings support the construct validity and reliability of the JSE-HPS for measuring empathy in pharmacy students.

Keywords: empathy, pharmacy student, health professions students, psychometrics, validity, reliability, scales

INTRODUCTION

Empathy is a core ingredient in healthcare provider-patient relationships.[1,2] Healthcare providers' degree of empathy has a direct link to positive clinical outcomes in diabetic patients.[3] Indicators of empathic engagement in patient care led to better patient compliance,[4-6] more accurate diagnosis,[7] more accurate prognosis,[8] increased patient satisfaction,[9] and decreased likelihood of litigation against healthcare providers.[10,11] In addition to psychosocial factors, empathy has neurological underpinnings documented in brain imaging studies.[12,13]

Despite the importance of empathy in patient care, there is a disturbing decline in empathy as health-profession students progress through training.[14-16] These findings have generated concern among health-professions educators not only to prevent the decline but also to enhance empathy among students. This concern can be empirically investigated only when the concept of empathy has been operationally defined and quantitatively measured.

Empathy is an ambiguous concept,[1] It has been described as a notion that is difficult to define and hard to measure.[17] There are too many descriptions and definitions of empathy to report in this article, but a review of such descriptions and definitions has been published elsewhere.[1] The following is an adaptation of the definition of empathy for the context of patient care: predominantly a *cognitive* attribute that involves an *understanding* of patients' concerns, the capacity to *communicate* this understanding, and an *intention to help*.[1,18]

Empirical research on empathy in patient care is facilitated by the availability of a validated instrument that is specific to empathic engagement in the context of patient care. A few instruments for measuring empathy are available for administration to the general population. Although none of these instruments was specifically developed to measure empathy in the context of patient care, the most frequently used among them are the Interpersonal Reactivity Index,[19] the Empathy Scale,[20] and the Emotional Empathy Scale.[21] A more detailed description of these and other measures of empathy has been provided elsewhere.[1(p63-74)]

The Jefferson Scale of Physician Empathy (JSPE) was developed nearly a decade ago in response to the need for a content-specific and context relevant instrument to

Corresponding Author: Nancy Fjortoft, PhD, Chicago College of Pharmacy, Midwestern University, 555 31st Street, Downers Grove, IL 60515. Fax: 630-971-60997. E-mail: nfjort@midwestern.edu

measure empathy in health-profession students and practitioners.[22] Evidence in support of the construct validity,[22] criterion-related validity,[22] predictive validity,[23] internal consistency,[22,24] and test-retest reliability[22,25] of the original scale has been reported in studies involving medical students,[22,25] physicians,[24] nurses,[26] and nurse practitioners.[27] The original JSPE has enjoyed broad attention by researchers around the world and, to date, has been translated into 39 languages. The original scale's desirable features, such as strong psychometrics and ease of administration and interpretation, have attracted researchers to administer the JSPE to medical students and physicians as well as to other health-profession students in dental,[16] nursing,[26,27] and pharmacy colleges and schools.[28]

Because the original scale was intended for use with medical students and physicians, its scores could serve only as a proxy measure of empathy with other health-profession students. Accordingly, it was desirable to modify the wording of the original scale slightly to improve its face validity for administration to students of diverse health professions, including pharmacy.

The authors of the original scale made additional revisions to adapt the original JSPE for administration to students in health professions other than medicine, thus generating the Jefferson Scale of Empathy-Health Profession Student version (JSE-HPS). This adaptation was prompted in response to an increasing number of requests for permission to use the scale in other health professions schools.

In the JSE-HPS for health professions students, 13 items from the medical-student version were modified by replacing "physician" with "healthcare provider." For example, in the medical student version "Physicians should try to stand in their patients' shoes when providing care to them" was modified to read "Healthcare providers should try to stand in their patients' shoes when providing care to them." Other items needed no modifications (eg, "Because people are different, it is difficult to see things from patients' perspectives"). Evidence in support of the validity and reliability of the JSE-HPS was reported in a study of undergraduate nursing students.[29] No data have been reported about the measurement properties of the JSE-HPS among pharmacy students. The purpose of the present study was to examine the validity and reliability of the JSE-HPS in a sample of pharmacy students. Because this version does not include the title of a specific health professional, such as pharmacist, nurse, dental hygienist, or physical therapist, it should be usable in comparative studies across the range of health professions.

METHODS

Research participants were a convenience sample of 187 first-year students of Chicago College of Pharmacy at Midwestern University, representing 87% of the total class of 214 students. The JSE-HPS instrument contained 20 items with response options based on a 7-point Likert scale (strongly agree = 7, strongly disagree = 1) and could be completed in less than 10 minutes. The 10 negatively worded items in the scale were reverse scored. A higher score indicated a behavioral tendency favoring empathic engagement in patient care.

The JSE-HPS was administered in January 2011 to students participating in an empathy workshop as part of a required course. The JSPE-HPS was completed by the students prior to their involvement in workshop activities as a pretest to evaluate the effectiveness of the workshop. Anonymity was maintained, but participants were asked to create a 4-digit/letter code (numeric, alphabetic, or both) on the survey and make note of the codes to be used in subsequent testing. Questions also were solicited about the students' gender and age. Students were assured of the confidentiality of their individual data, and the survey instrument was destroyed after data were entered into computer files. The study was given an exempt status by the Midwestern University Institutional Review Board.

Principal component factor extraction with orthogonal rotation was used to examine underlying components of the JSPE-HPS in pharmacy students. Correlational method and *t* test for independent groups also were used. The level of statistical significance (probability of type 1 error) was set at 0.05, and SAS, 9.1 for Windows (Statistical Analysis System Institute, Cary, NC) was used.

RESULTS

Participants used the full range of responses to each JSE-HPS item (1 to 7), with the exception of one reverse-score item for which the response range was 2-7: "Attentiveness to patient's personal experiences does not influence treatment outcomes." The item mean scores ranged from a low of 3.7 (for the reverse-score item "Because people are different, it is difficult to see things from patients' perspectives") to a high of 6.3 (for the item "Patients feel better when their healthcare providers understand their feelings.") Item standard deviations ranged from 1.0 to 1.7.

The corrected item-total score correlations also were examined. In calculating these correlations, the corresponding item was excluded from the total score. The corrected item-total score correlations ranged from a low of 0.09 to a high of 0.69 with a median of 0.55. The highest item-total score correlation ($r = 0.69$) was obtained

for the item "Healthcare providers' understanding of the emotional status of their patients, as well as that of their families, is one important component of healthcare provider-patient relationships." The lowest item-total score correlation was obtained for the item "It is difficult for a healthcare provider to view things from patients' perspectives." The corrected item-total score correlations are reported in Table 1.

Kaiser's measure of sampling adequacy was used prior to factor extraction, which resulted in an overall index of 0.86, confirming the adequacy of data for factor analysis. The Bartlett's test for sphericity showed that the intercorrelation matrix was factorable ($\chi_{(190)} = 1254.1, P < 0.001$).

Five factors emerged with eigenvalues of 6.2, 1.6, 1.4, 1.2, 1.1, respectively. We did not use Kaiser's suggestion[30] to retain factors with an eigenvalue greater than

Table 1. Summary of Factor Analysis and Corrected Item-Total Score Correlations of the Jefferson Scale of Empathy-Health Profession Student Version (JSE-HPS) Administered to 187 Pharmacy Students

Item (sequence in scale)[a]	Rotated Factor Coefficients		
	Factor 1	Factor 2	r_{it}
1. Empathy is a therapeutic skill without which a health care providers' success is limited. (15)	0.80 [b]	0.08	0.50
2. Patients value a health care provider's understanding of their feelings which is therapeutic in its own right. (10)	0.72 [b]	0.12	0.47
3. Health care providers' understanding of the emotional status of their patients, as well as that of their families is one important component of the health care provider – patient relationship. (16)	0.64 [b]	0.40	0.69
4. Patients feel better when their health care providers understand their feelings. (2)	0.59 [b]	0.21	0.48
5. I believe that empathy is an important factor in patients' treatment. (20)	0.52 [b]	0.18	0.57
6. Health care providers should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language. (13)	0.52 [b]	0.12	0.55
7. I believe that emotion has no place in the treatment of medical illness. (14)	0.52 [b]	0.40 [b]	0.59
8. Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints. (12)	0.48 [b]	0.56 [b]	0.59
9. Understanding body language is as important as verbal communication in health care provider-patient relationships. (4)	0.43 [b]	0.20 [b]	0.57
10. Health care providers should try to stand in their patients' shoes when providing care to them. (9)	0.40 [b]	0.36 [b]	0.55
11. Health care providers should try to think like their patients in order to render better care. (17)	0.39 [b]	0.11	0.36
12. Health care providers' understanding of their patients' feelings and the feelings of their patients' families does not influence treatment outcomes. (1)	0.04	0.77 [b]	0.33 [b]
13. Attentiveness of patients' personal experiences does not influence treatment outcomes. (8)	0.16	0.74 [b]	0.61 [b]
14. Attention to patients' emotions is not important in patient interview. (7)	0.23	0.73 [b]	0.58 [b]
15. Patients' illnesses can be cured only by targeted treatment; therefore, health care providers' emotional ties with their patients do not have a significant influence in treatment outcomes. (11)	0.32	0.64[b]	0.63[b]
16. A health care provider's sense of humor contributes to a better clinical outcome. (5)	−0.03	0.10	0.25
17. Health care providers should not allow themselves to be influenced by strong personal bonds between patients and their family members. (18)	0.07	0.10	0.17
18. I do not enjoy reading non-medical literature or the arts. (19)	0.07	0.10	0.15
19. Because people are different, it is difficult to see things from patients' perspectives. (6)	0.01	0.02	0.10[c]
20. It is difficult for a health care provider to view things from patients' perspectives. (3)	−0.01	0.01	0.09[c]
Eigenvalue	6.2	1.6	—
Percent of variance	31%	8%	—

Abbreviations: r_{it} = corrected item-total score correlations.
[a] Items are listed by descending order of magnitude of factor coefficients within each factor. Factor 1 is considered as a construct involving "perspective taking" and factor 2 as a construct involving "compassionate care." Numbers in parentheses represent the sequence of the items in the actual scale.
[b] Factor coefficient ≥ 0.39.
[c] Nonsignificant, all other item-total score correlations are statistically significant ($P < 0.05$).

one, because, according to Velicer and Fava,[31] a minimum of 3 items per factor is required for a stable factor structure. Because 2 items had substantial factor coefficients under factors 3-5, the scree test was applied to determine the appropriate number of factors to retain for rotation. Based on the plot of the eigenvalues that leveled off after the second factor, a 2-factor solution was selected. Summary results of factor analysis are reported in Table 1.

Eleven items had the highest factor coefficients (≥ 0.39) on the first extracted factor, a grand factor of "perspective taking," which accounted for the largest proportion of the variance before rotation (31%). Four reverse-scored (negatively worded) items had the highest factor coefficients (< 0.64) on the second factor. Three additional items had significant factor loadings (> 0.39) on the factor "compassionate care," which accounted for an additional 8% of the variance. Four items (3, 7, 8, and 10) were bifactorial with substantial coefficients on both factors. Five items did not have substantial factor coefficients on any of the first 2 extracted factors. However, these items had high factor coefficients on the residual factors. The mean, median, standard deviation, quartiles, range, and internal consistency reliability (Cronbach's coefficient alpha) of the JSE-HPS for pharmacy students are reported in Table 2. The shape of the score distribution approached normal, with a mean of 110.7, a median of 111, and a standard deviation of 12.1. The reliability coefficient alpha was 0.84.

Of the total sample, 86% (93 women, 67 men) responded to the gender question. The mean empathy score for women was 112.8 ± 11.3, which was higher than that for men (106.3 ± 13.1). The gender difference in favor of women was not only statistically significant ($t_{(158)} = 3.4, P < 0.01$), but also of practical importance (effect size = 0.61). Based on the operational definition of the effect sizes, this magnitude of effect is considered clinically important.[32,33]

DISCUSSION

The findings provide evidence supporting the psychometric soundness of the JSE-HPS for pharmacy students.

Table 2. Descriptive Statistics for the Jefferson Scale of Empathy – Health Profession Students Version and Pharmacy Students Performance (N = 187)

Score, Mean (SD)	110.7 (12.1)
25th Percentile Score	104
50th Percentile (Median) Score	111
75th Percentile Score	119
Possible Score Range	20-140
Actual Score Range	40-134
Alpha Reliability Coefficient	0.84

Results of factor analysis indicate that the pattern of factor structure of the JSE-HPS for pharmacy students is somewhat similar to that found for medical students[1] and physicians.[24] A similar grand factor (perspective taking) also emerged in the JSE for samples of medical students and physicians.[1,24] For example, in this study, there are 9 items under factor 1 and 6 items under factor 2 that also emerged under factors 1 and 2, respectively, in a sample of American physicians.[24]

A somewhat similar pattern of factor structure was also observed in 3 other studies in which the original scale was used with students at a dental school,[16] with Mexican medical students,[34] and with Japanese medical students.[35] The similarity in factor structure of the original and the revised scales suggests that, despite modifications made in the JSE-HPS, the underlying components of the scale, particularly the prominent factors of perspective-taking and compassionate care, remained intact. Perspective-taking and compassion have been described as the core ingredients of empathy.[1] Therefore, the consistency of the underlying factors with the conceptual framework[36] of empathy and replicability of major underlying factors that emerged in this study, as in other research with physicians, provides support for the construct validity of the JSE-HPS version for pharmacy students.

The naming of factors is a subjective matter. We named factor 1 as a perspective-taking construct because most of the items under this factor describe an attempt to understand the concern of the patient (the word *understanding* is used in 6 items under this factor). Factor 2 is called compassionate care because most of the items describe feeling and emotion associated with empathic understanding. Compassion has been described as an area of overlap between empathy (a predominantly cognitive attribute) and sympathy (a predominantly affective attribute).[1(p11)]

Our finding that female pharmacy students obtained a significantly higher average empathy score than did their male counterparts is consistent with previous findings involving physicians[24] and medical students.[22,25] This finding also can be considered an indicator of the validity of the JSE-HPS in pharmacy students (validity by the method of "contrasted groups" to confirm differences in the expected direction).[37] The internal consistency aspect of the scale's reliability was supported by the coefficient alpha, which is at an acceptable level for psychological and educational tests.[38]

Limitations of this study, including the single-institution research and the convenience sample, may jeopardize the external validity or generalization of the findings. Further research is needed to confirm these findings in different samples of not only pharmacy students but also students in other healthcare professions schools.

Further research is also needed to examine whether the 2-factor solution would be sufficient in different samples and whether those items with insignificant item-total score correlations and those in residual factors must be modified, retained, or removed from the instrument. We suggest retaining all of those items in the instrument for comparative purposes, unless additional findings confirm that they do not add to the validity and reliability.

Availability of the scale provides ample opportunities for the assessment of educational programs intended to enhance healthcare professions students' empathic engagement in patient care. Future research can use the scale in a pretest-posttest study to empirically examine changes in empathy over time during pharmacy education. We already have embarked on a study to assess the effects of a workshop on a variation of the "aging game,"[39] focusing on pharmacy students' empathic understanding of elderly patients.

CONCLUSION

The JSE-HPS for pharmacy students can be used in the assessment of educational outcomes of different programs to enhance empathy, in research on correlates of empathy in pharmacy education and practice, and in group comparisons within the pharmacy discipline as well as between pharmacy and other health profession disciplines. The psychometric support of the JSE-HPS reported in this study can bolster researcher confidence in using a validated instrument for empathy studies in pharmacy education.

ACKNOWLEDGMENTS

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