RESEARCH

Validation of an Empathy Scale in Pharmacy and Nursing Students

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Objective. To validate an empathy scale to measure empathy in pharmacy and nursing students.

Methods. A 15-item instrument comprised of the cognitive and affective empathy domains, was created. Each item was rated using a 7-point Likert scale, ranging from strongly disagree to strongly agree. Concurrent validity was demonstrated with the Jefferson Scale of Empathy – Health Professionals Students (JSE-HPS).

Results. Reliability analysis of data from 216 students (pharmacy, N=158; nursing, N=58) showed that scores on the empathy scale were positively associated with JSE-HPS scores (p<0.001). Factor analysis confirmed that 14 of the 15 items were significantly associated with their respective domain, but the overall instrument had limited goodness of fit.

Conclusions. Results of this study demonstrate the reliability and validity of a new scale for evaluating student empathy. Further testing of the scale at other universities is needed to establish validity.

Keywords: empathy, psychometrics, pharmacy students, nursing students

INTRODUCTION

By 2030, nearly 22% of the United States population will be aged 65 years or older,1 increasing from 12.9% in 2009.2 These older adults have more chronic diseases than did previous generations.3 Healthcare professionals need to be well prepared to address the needs of the growing population of older adults.4 However, students and new practitioners may have difficulties understanding and empathizing with older adults, as they may not have experienced aging-related challenges, such as disability and disease.

Empathy can be defined as the ability to understand and view the world from other people’s perspectives and to connect with their experiences or feelings.5 Two decades ago, healthcare professionals had negative views of aging and were not empathetic toward older adults.6-8 Healthcare professionals demonstrated more empathy regarding older adults’ abilities, the aging process, and older adults in general, perhaps because of the incorporation of geriatric-specific education into the health professions curricula.9-17 However, empathy declined among health professions students by the end of the first year in their program.18

In pharmacy education, the Accreditation Council for Pharmacy Education (ACPE) revised standards and the American Association of Colleges of Pharmacy (AACP) outcomes recognize the importance of displaying empathy during all healthcare interactions.19,20 The ability to demonstrate empathy should be considered during the admission process for the doctor of pharmacy (PharmD) degree program, included as a learning outcome, and taught in the communication courses.19-22 In baccalaureate nursing education, the American Association of Colleges of Nursing (AACN) also emphasizes the importance of empathy and caring as part of the professional role and of all healthcare interactions.23 Therefore, integrating activities within the curriculum, such as interprofessional experiences, experiential education, geriatric electives, and simulation games that improve health professions
students’ empathy toward different patient populations is needed to promote patient-centered care.\textsuperscript{4,7,9,13,16,24-31}

For several years, the College of Pharmacy and the School of Nursing at Purdue University incorporated educational activities to address ACPE and AACN standards.\textsuperscript{19,23} A need existed to assess whether these activities resulted in changes in student empathy toward a specific patient group or population. After performing a thorough literature review, only 1 reliable and valid instrument to measure empathy among pharmacy and nursing students was identified: the Jefferson Scale of Empathy – Health Professional Students (JSE-HPS).\textsuperscript{32-36} The JSE-HPS, which measures empathetic qualities and tendencies, was modified from the Jefferson Scale of Empathy to include health professions students. The original Jefferson Scale of Empathy was created using a modified Delphi method.\textsuperscript{32} After performing a literature review on the term “empathy,” a panel of physicians was used to develop a pilot scale. Final psychometric testing was completed in a group of medical residents and medical students.\textsuperscript{32}

While the JSE-HPS addresses relevant aspects of empathy as perceived by healthcare professionals and has been successfully used in both pharmacy and nursing students, it was not based in theory. Researchers felt that a theoretical background for a scale would better explain changes in students’ empathy, and there was considerable interest in examining empathy as conceptualized from a theoretical background. Furthermore, the cost associated with using the scale routinely for assessment was a barrier. The purpose of this project was to develop and validate a new, alternative instrument to measure the cognitive and affective constructs of empathy for eventual use in routinely assessing changes in student empathy throughout the curriculum.

METHODS

Researchers from the College of Pharmacy and the School of Nursing collaborated to develop the Kiersma-Chen Empathy Scale (KCES). The literature was reviewed to gain an understanding of the conceptualization of empathy, with emphasis on its theoretical background. After the initial literature review, the authors used the conceptualization of cognitive and affective empathy by Davis\textsuperscript{5} as the theoretical foundation for developing the scale. In 1994, Davis\textsuperscript{5} conceptualized empathy as having 2 distinct domains: cognitive and affective. In the cognitive domain, individuals have the ability to understand and view the world from other people’s perspective. In the affective domain, individuals are able to connect to the experiences or feelings of others.\textsuperscript{5}

Multiple items were created for each of the domains based on the constructs identified in an extensive review of the literature on cognitive and affective empathy. Each item developed was examined using accreditation standards for pharmacy and nursing programs to ensure that the instrument could assist in the evaluation of student empathy for both programs. After peer review by researchers in pharmacy and nursing, 9 items pertaining to the cognitive domain and 6 items pertaining to the affective domain remained. Four of the 15 items that were worded negatively were reverse-coded when scored. For each of the items, participants rated their level of agreement or disagreement using a 7-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree. Higher scores on the KCES indicated greater student empathy, and scores could range from 15 to 105.

The JSE-HPS was selected to establish concurrent validity, as it has been found to be a valid and reliable measure of empathy among medical students\textsuperscript{32,35,36} and more recently, among pharmacy and nursing students.\textsuperscript{33,34} The JSE-HPS contains 20 items (7-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree) with 10 negatively worded items, which were reverse-coded when scored. Higher scores on the JSE-HPS indicated greater student empathy, and scores could range from 20 to 140.

Institutional review board approval (exempt status) was obtained prior to data collection. The Geriatric Medication Game, an aging simulation game specifically addressing the challenges of older adults that was developed by the St. Louis College of Pharmacy, was chosen to test the KCES.\textsuperscript{14,37} In the game, students “become” older adults and experience physical, psychological, and financial problems while navigating the healthcare system and performing challenges. A modified version of the game, described previously,\textsuperscript{38} was incorporated into the pharmacy curriculum as part of a pharmacy practice skills laboratory to address the ACPE standard regarding professional attitudes and values during healthcare interactions as well as student empathy toward older adults.\textsuperscript{19}

In order to address similar standards within the nursing curriculum, nursing students who were enrolled in a sophomore-level clinical course focusing on the care of older adults also participated in the game as part of the course activities.

Students completed the JSE-HPS and KCES prior to beginning the skills laboratory to determine their baseline empathy toward older adults and again after participating in the game to measure changes in empathy as a result of the game. An anonymous identifier was used to match the baseline and post-game tests. Additional demographic information, including gender, age, and the degree program in which the student was enrolled, was obtained.

Statistical analyses were performed using SPSS, v. 19.0 (IBM, Armonk, NY) for Windows, with an \textit{a priori}
level of significance \( \alpha = 0.05 \). Frequencies were calculated for demographic items. Reliability of the KCES and JSE-HPS was measured using the Cronbach alpha for pharmacy students, nursing students, and the combination of pharmacy and nursing students. A coefficient alpha of 0.8 or greater was considered indicative of good reliability. Because the JSE-HPS was previously validated for use among health professions students, correlation coefficients were used to determine concurrent validity between the JSE-HPS and KCES.

Because the KCES was constructed on a theoretical framework suggested by Davis, confirmatory factor analysis (CFA) was performed to test the model, underscoring the relationship between the items and their corresponding factor (ie, cognitive or affective empathy). Analyses were performed in SAS v. 9.3 (SAS, Inc., Cary, NC) using the PROC CALIS procedure on the baseline test data. Model fit was assessed using the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMSR) fit statistics. A RMSEA value of \( \leq 0.08 \) and SRMSR value of \( \leq 0.10 \) indicate a reasonable model fit, with a RMSEA value of \( \leq 0.06 \) and SRMSR value of \( \leq 0.05 \) being indicative of a good fit.

**RESULTS**

Two hundred and sixteen students (pharmacy N = 158 and nursing N = 58) completed the baseline and post-game tests. The majority of students were between the ages of 19 and 21 and female (Table 1). Reliability analysis provided a Cronbach \( \alpha \) of 0.851 and 0.869 for the KCES baseline and post-game test scores, respectively, and 0.821 and 0.889 for the JSE-HPS baseline and post-game test scores (Table 2). The average reliability for the KCES was 0.860 and 0.855 for the JSE-HPS. Individual analyses for pharmacy and nursing students test scores were similar, with the exception of the KCES baseline test scores for nursing being lower (\( \alpha = 0.689 \)) than those for pharmacy (\( \alpha = 0.851 \)).

The baseline and post-game test scores for the KCES also were positively correlated with those for the JSE-HPS in pharmacy students than in nursing students. The KCES was found to correlate significantly with the JSE-HPS, providing evidence for concurrent validity. Correlations between the KCES and the JSE-HPS for the baseline and post-game test scores were between 0.59 and 0.77, respectively, which can be characterized as medium to strong correlations. According to the concurrent validity of KCES appeared to be good to very good.

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**DISCUSSION**

Healthcare professionals need to be well prepared to address the needs of a diverse patient population. Both
pharmacy and nursing education support the development of empathy in students with respect to their interactions with patients. Appendix D of the ACPE revised standards for pharmacy education acknowledges that empathy should be demonstrated in all practice experiences as part of professionalism. According to ACPE Guideline 17.3, empathy is considered a desirable quality to support the student’s potential to become a self-directed lifelong learner and an effective professional. Additionally, an AACP policy statement recently was approved for supporting the development of measureable behavioral competencies that include professional attitudes and values. The KCES was developed to measure changes in empathy among students after they participated in an aging-related game.

The KCES was found to be a reliable measure of empathy for pharmacy and nursing students. The Cronbach alpha for the baseline and post-game tests of the KCES were greater than 0.8 for the combined analysis of pharmacy and nursing students as well as the analysis of pharmacy students, which is indicative of good reliability. Furthermore, the Cronbach’s alpha for the nursing students was greater than 0.8 for the post-game but not the baseline test. Reliability and concurrent validity were lower in nursing students than in pharmacy students. Given that only 58 nursing students participated, variability in experience with older adults may have contributed to differences. Future work should assess the reliability and concurrent validity of this scale in a larger sample of nursing students.

As anticipated, JSE-HPS reliability was similar to that found in previous research. In 2011, Fjortoft and colleagues found the Cronbach’s alpha of the JSE-HPS to be 0.84 in pharmacy students, and Fields and colleagues found $\alpha = 0.78$ in nursing students. Therefore, the JSE-HPS is a reliable measure of empathy in pharmacy and nursing students. There could be differences in students between universities that may make the JSE-HPS less reliable in some groups, but this study confirmed the reliability of the JSE-HPS in both pharmacy and nursing students.

The KCES and the JSE-HPS were moderately and positively associated in both the baseline and post-Game assessments. While there is no exact definition for weak, moderate, and strong correlations, the closer the number is to 1 or -1, the stronger the correlation. Because of inconsistency in the literature and given that the correlation is greater than 0.5 but not as high as 0.8 or 0.9, the KCES and the JSE-HPS were considered moderately correlated. The number of items (KCES=15 items, JSE-HPS=20 items) or the manner in which the scales were constructed could have contributed to the strength of the correlation. For example, JSE-HPS, which was originally constructed using a modified Delphi method before psychometric evaluation, measured multiple aspects of empathetic qualities and tendencies. The KCES, which was based on the definition by Davis in 1994, included 2 specific constructs of empathy. Future work should examine and determine the concurrent validity of the KCES to other measures of empathy, such as the Empathy Construct Rating Scale, the Interpersonal Reactivity Index, and the Layton Empathy Test.

CFA indicated that the model did not have a good fit with the data. While the SRMSR indicated an acceptable fit, other criteria did not meet the standards. Fourteen of the 15 items had a significant relationship with their respective factor. Additionally, the cognitive and affective scales of empathy significantly covaried. This finding may explain why the model and data did not have a better fit. Cognitive and affective empathy represent 2 aspects of empathy and are similar by definition, as cognitive empathy encompasses understanding another’s perspective while the affective empathy relates to an individual’s connection to the feelings or experience of another. While the scale was created to measure the domains of cognitive and affective empathy, it may be difficult to determine a difference between the 2 aspects.

Even though the KCES was found to be reliable and to have good internal consistency, the scale has been administered at only 1 institution in pharmacy and nursing students and, therefore, may not be reliable or valid for measuring empathy among health professions students at other institutions. Because of the small sample of nursing students and, therefore, may not be reliable or valid for measuring empathy among health professions students at other institutions. Because of the small sample of nursing students...
students (N=58), validation of the scale in a larger group of nursing students is needed. Future work should validate the KCES on a larger scale to determine its reliability and validity, particularly at other institutions and with students in other health professions, such as medicine, dentistry, and dietetics.

Since the KCES was used as a pre- and post-measure of empathy with an aging simulation game, it may reliably measure empathy only toward older adults. The items on the KCES did not specify a particular patient group, such as older adults. Instead, the term “someone else” was used to allow for future work validating the use of the KCES with different curricular activities designed to improve empathy toward other patient groups. However, given that the directions on the KCES specified that students were to rate their level of agreement with the assessment items as related to older adults, the KCES may be a reliable measure of empathy only toward older adults.

CONCLUSION

With few other validated measures of empathy available, the KCES may be a useful instrument for pharmacy and nursing faculty members in assessing whether curricular or experiential activities incorporated within the curriculum meet ACPE and AACN standards regarding professional attitudes and values. Because accreditation standards for pharmacy colleges and schools encourage the development of professional attitudes and values, it is important for pharmacy educators to demonstrate how we are meeting these standards on a routine basis. The KCES is a viable option for measuring changes in students’ empathy, has no fee for use, was shown to be reliable in both pharmacy and nursing students, and demonstrated concurrent validity with the JSE-HPS. While additional testing of the KCES is necessary to determine the true reliability and validity of the scale, particularly at other institutions or with regard to other activities, this study has provided initial evidence that the KCES may be an effective alternative for measuring pharmacy and nursing students’ empathy toward older adults.

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