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Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: Health provider – student version

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While empathy is commonly accepted as a mutually beneficial aspect of the health provider–patient relationship, evidence exists that many health profession students are unable to demonstrate this important skill. This study, the initial phase of a 2-year longitudinal series, examined measurement properties of the Jefferson Scale of Physician Empathy (JSPE) adapted for administration to health profession students (JSE-HPS version), and investigated group differences of empathy scores in the baccalaureate nursing (BSN) program within the College of Health Professions at a public university in the southeastern part of the USA. The 20-item survey and a demographic questionnaire were completed by 265 BSN students. Correlational analyses, t-test, and analysis of variance were used to examine internal relationships and group differences. Results showed the median item-total score correlation was statistically significant (0.42). The internal consistency of the scale (Cronbach’s coefficient α) was 0.78, falling within the generally agreed standard. Test-retest reliability coefficients were acceptable at 0.58 (within 3 months interval) and 0.69 (within 6 months interval) between testing. Women scored higher than men and older students outscored younger classmates. No significant relationship was found between empathy scores and ethnicity, previous non-nursing degree, or importance of religion to the participant. These findings support measurement properties of the JSE-HPS version, and can bolster the confidence of researchers in using the Scale for measuring empathy in diverse health profession students, as one component of program evaluation as well as evaluating interprofessional learning activities among diverse healthcare professional students and interprofessional collaboration.

Keywords: Professionalism; multidisciplinary; surveys; evaluation research; quantitative method; interprofessional evaluation

INTRODUCTION

Empathy is commonly accepted as an important component of professionalism, (Veloski, Fields, Boex, & Blank, 2005; Veloski & Hojat, 2006) and a mutually beneficial attribute of the health provider–patient relationship across the health professions (Boyle et al., 2010; Reiss, 2010). Psychologists, sociologists, nurses, physicians, and other health professionals have studied the concept of empathy for many years (e.g., Alligood, 1992; Aring, 1958; Fields et al., 2004; Hogan, 1969; Hojat et al., 2001; Olson, 1995; Reynolds & Scott, 2000; Svensen & Bergland, 2007).

Conceptualization and definition of empathy

Empathy, a multi-dimensional concept, has been described as elusive, difficult to define, and hard to measure (Pike, 1990). Aring (1958) defined empathy as the appreciation for another person’s feelings, without joining them, as opposed to sympathy that is considered the act or feelings of joining with another person. Through the years, researchers have attempted to be more specific in their definitions. Alligood (1992) described two types of empathy, basic or innate, and trained. Other studies have described cognitive and emotional or affective empathy (e.g., Dziobek et al., 2008). Through functional MRI studies Derntl et al. (2010) identified gender differences within three components of empathy (emotion recognition, perspective taking, and affective responsiveness). In the context of patient care, Olson (1995) defined empathy as ‘the skill of understanding what a patient is saying and feeling, and communicating this understanding verbally to a patient’ (p. 151). Expanding upon Olson’s conceptualization, we adapted the definition of empathy as a predominantly cognitive attribute that involves...
an understanding of patients’ experiences combined with a capacity to communicate this understanding and an intention to provide help to the patient (Fields et al., 2004; Hojat et al., 2001, 2002a,b).

Benefits of empathy in healthcare

Studies by health professionals suggest that empathic engagement in patient care can lead to better patient compliance (e.g., DiMatteo et al., 1993); more accurate prognosis (Dubnicki, 1977), and increased patient satisfaction (Zachariae et al., 2003). In a clinical outcome study, it was found that nurses’ empathic engagement in patient care was predictive of reduced anxiety, depression, and hostility in cancer patients (LaMonica, Wolf, Madea, & Oberst, 1987). Consistent with these findings, Sullivan (1990) reported that empathic nurse–patient communication resulted in decreased levels of stress among patients and also served as a buffer against potential psychological and health-related problems among nurses. Recently, a significant link was found between physician empathy and optimal physiologic outcomes in diabetic patients (Hojat et al., 2011).

Development of empathy in healthcare providers

A number of authors (e.g., Alligood 1992; Hojat 2009; Nerdrum 1997) have suggested that empathy in healthcare providers can be developed through basic and graduate professional education and/or supported through continuing education efforts for practitioners. Accordingly, many educators incorporated the development of empathic skills as the basis of therapeutic communication into health professional curricula to help students and practitioners progress towards a higher degree of empathy (e.g., Davis, 1983; Harlak et al., 2008; Svensen & Bergland, 2007).

Recent systematic reviews of the literature regarding conceptualization and measurement of empathy in nursing by Yu and Kirk (2010); in social work by Gerdes, Segal, and Lietz (2010); and in medicine by Hemmerdinger, Stoddart, and Lilford (2007), continue to point out inadequacies in many of the assessment tools and limitations in studies. The majority of the studies focus on one specific health profession. Only a few comparisons of levels of empathy among different professions have been found in the literature. For example, levels of empathy were examined in nurses and physicians (Fields et al., 2004), and in nurse practitioners and physicians (Hojat, Fields, & Gonnella, 2003a).

We had difficulty in finding studies of empathy extending across several professional groups. A study by Boyle et al. (2010) of 459 Australian undergraduate students from emergency health/paramedic, nursing, midwifery, occupational therapy, physiotherapy, and health science found that there was not a significant difference in the level of empathy \( (p = 0.862) \) across the six programs. They also found female students to be more empathetic than the male students \( (M = 109.79, SD = 14.73) \).

There have been studies of practitioners and students across the professions for other elements related to professionalism (Veloski & Hojat, 2006). For example, attitudes toward interprofessional collaboration among physicians and nurses as well as other members of the healthcare team have been studied extensively worldwide (Fields et al., 2004; Hojat et al., 2003b; Hojat & Gonnella, 2011; Hong, Wright, Gagliardi, Brown, & Dobrow, 2009; Linqvist, Duncan, Shepstone, Watts & Pearce, 2005). Comparisons across cultures have also been conducted (Hojat et al., 2003b). Although teamwork is vital to safety and effectiveness, assessment of interprofessional teamwork in most healthcare settings, especially the critical care areas such as the operating room, emergency room, and intensive care units in the hospital, has been extremely difficult to accomplish due to the complex nature of patient care and personal characteristics of each participating profession (Healey, Undre, Sevdalis, Koutantji, & Vincent, 2006). Assessing attitudes toward ethical issues in healthcare among interprofessional students and/or practitioners has been another challenging area for researchers (Buelow, Mahan, & Garrity, 2010). In a study by Ward et al. (2009), a significant correlation \( (r = 0.32, p < 0.01) \) was reported between nursing students’ scores on empathy and attitudes toward interprofessional collaboration.

There is evidence internationally that many health profession students continue to demonstrate limited ability to communicate empathy in practice (Reynolds & Scott, 2000). The educational experience itself has been implicated in the reduction of caring behaviors of medical and nursing students in the US and abroad, especially during the in-depth clinical learning experience (e.g., Hojat et al., 2009; Ward, et al., 2009). Various experiential factors may be influential, including, social, political, economic, and generational factors (e.g., Harlak et al., 2008; Reynolds & Scott, 2000).

A recent meta-analysis of studies conducted over 30 years in the US by researchers at the University of Michigan, found that undergraduate college students generally have much less empathy than students in past generations (Konrath, O’Brien & Ksing, 2011). As these students enter the health professions faculty will need to assess their caring behaviors and develop strategies to increase the students’ ability to provide empathetic care.

Measurement of empathy

A complex concept such as empathy cannot be empirically investigated in the absence of a psychometrically sound measuring instrument. A few instruments for measuring empathy were developed for administration to the general population. The most frequently used among them are the Interpersonal Reactivity Index (IRI; Davis, 1983); the Empathy Scale (Hogan, 1969); and Emotional Empathy (Mehrabian & Epstein, 1972). None of these instruments was specifically developed to measure empathy in the context of patient care. The IRI was developed for use in the general population, but has been utilized in healthcare research. The IRI includes 28 items incorporating four components of empathy in the cognitive and emotional domains. The 30-year study of empathy in college students mentioned earlier utilized the IRI (Konrath et al., 2011). In the Hogan Empathy Scale, high scorers were more likely than low scorers to be socially acute and sensitive to nuances in interpersonal
relationships and low scorers were more likely to be hostile, cold, and insensitive to the feelings of others (Hogan, 1969). The Emotional Empathy Scale by Mehrabian and Epstein used an affective conceptualization of empathy that conflicts with our definition as primarily a cognitive concept in the context of patient care. The above measures lack face and content validities for administration to health profession students (Hojat, 2007). LaMonica (1981) developed the Empathy Construct Rating Scale which measures respondents’ feelings toward another person, but it cannot be administered to health professions students as a self-report empathy measure, as it requires reporting by an observer which is time consuming and costly.

BACKGROUND

The Jefferson Scale of Physician Empathy (JSPE) was originally developed for administration to medical students and physicians (Hojat, 2007; Hojat et al., 2001). Because it was psychometrically validated, easy to interpret, administer and analyze, the scale has been used by other professions, including dentistry (Sherman & Cramer, 2005) and nursing (Fields et al., 2004; Hojat et al., 2003b) without modifications to improve its face validity in these other professions. The original JSPE has received broad attention by researchers in diverse health professions around the world and to date has been translated into 38 languages. Evidence in support of its construct validity (Hojat et al., 2001); criterion-related validity (Hojat et al, 2001); predictive validity (Hojat, Mangione, Nasca, & Gonnella, 2005); internal consistency (Hojat et al., 2002b); and test-retest reliability (Hojat et al., 2002a,b) has been reported in medical students (Hojat et al., 2001), physicians (Hojat et al., 2002b); nurses (Fields et al., 2004); and nurse practitioners (Hojat et al., 2003a). Ward et al. (2009) modified the JSPE specifically for administration to undergraduate nursing students. This specific version cannot be administered for comparative research to other students in the health professions, because the items were adapted specifically for nursing students. There was a need for a sound instrument with satisfactory face validity and measurement properties for administration to students of diverse health professions.

The authors of the JSPE recently made additional revisions to adapt the Scale for administration to students in health professions other than in medicine (JSE-HPS version). This adaptation was prompted in response to the increasing number of requests for permission to use the Scale in other health professions schools. The new JSE-HPS version contains 20 items, each answered on a 7-point Likert scale (strongly agree = 7, strongly disagree = 1) and can be completed in less than 10 min. There are 10 negatively worded items in the scale which are reverse scored. A higher score means that the student has more of an orientation or behavioral tendency toward empathic engagement in patient care (Hojat et al., 2002a).

In the JSE-HPS version for health provider students, 13 items from the medical student version were modified by replacing ‘physician’ with ‘healthcare provider’. For example, the following item in the medical student version: ‘Physicians should try to stand in their patients’ shoes when providing care to them’ was modified to read: ‘Health care providers should try to stand in their patients’ shoes when providing care to them’. Other items needed no modifications (e.g., ‘Because people are different, it is difficult to see things from patients’ perspectives’). In a pilot study, the face validity of the adapted version was evaluated and confirmed by a small group of researchers in medical and nursing education. No data have been previously reported about the measurement properties of the JSE-HPS version. The objective of the current study was to examine the measurement properties of the JSE-HPS version for administration to one group of health professions students, and to investigate group differences on empathy scores. Since this version does not include the title of a specific health profession, such as physician, nurse, dental hygienist, physical therapist, it should be capable of use in comparative studies across the range of health professionals.1

METHODS

Study design

This is a descriptive and correlational study for psychometric analyses of the adapted empathy scale. It was part of a longitudinal investigation to examine changes in empathy during and at the end of the student’s professional education.

Participants

Total research participants included 285 students in the third and fourth years of the baccalaureate nursing program at the College of Health Professions at Armstrong Atlantic State University in Savannah, Georgia, USA. Generics students enter the nursing program after 2 years of a required core of general education and graduate with a Bachelor of Science degree and eligibility to take the national certifying examination toward licensure as a Registered Professional Nurse. Graduates of 2 or 3 year diploma or associate degree nursing programs with 2 years of the required core general education program and Registered Nurse licensure may be admitted to the RN-BSN flexible accelerated program including six required nursing courses. Licensed Practical nurses (LPN), with core general education requirements, may also be admitted to a flexible accelerated nursing education program (LPN-BSN) individually determined. Only nursing students participated at this stage where the primary goal was to first psychometrically validate the Scale with one discipline. No other health professional program in the institution was comparable. Health Science is a 4-year pre-professional curriculum, Dental Hygiene is a 2-year associate degree program, Rehabilitation Sciences is a 4-year preparatory program for graduate study in Physical or Occupational Therapy, and Radiologic Sciences is a 4-year program where students can specialize in several different disciplines during the final 2 years.
Research instruments
In addition to the JSE-HPS version described above, a demographic survey developed by the department of nursing research team to solicit additional information such as previous non-nursing related university education or degree, marital status, ethnic background, and importance of religion in the participants lives.

Procedures
Subsequent to approval from the University Institutional Review Board (IRB), and approval of the nursing department faculty, the JSE-HPS version and the demographic survey were administered to all nursing students during the first week of class in August 2009. The researchers explained the purpose of the study to each class and distributed a hand out describing the empathy definition used in the study as well as the procedures necessary to complete the questionnaire. Students were identified by the last four digits of their school identification number in order to maintain anonymity, to match the empathy scores with demographic data, and to facilitate a longitudinal follow-up. Anonymity was assured and the consent was implied by response to the two instruments. At the end of the semester in December 2009, the JSPE-HPS version was administered again to the 3rd year first semester students and the 4th year second semester students (prior to graduation). In May of 2010, the JSPE-HPS-version was administered again to the 4th year nursing students graduating in May of 2010.

Analysis
Correlational methods, t-test, and analysis of variance were used for statistical analyses. Sum of Likert weights given to each item was treated as an interval scale of measurement, and parametric statistical methods were used which often yield more statistical power than nonparametric methods. The level of statistical significance (probability of type 1 error) was set at 0.05 for all statistical analyses. We used SAS version 9.1 for Windows for statistical analyses.

RESULTS
There were 265 students (from the 285 sample) with usable data for final statistical analysis: 137 (3rd year), 117 (4th year), and 11 RN-BSN students. Eighty-eight percent (n = 233) of the total students were women (see Table I).

Analyses at item level
Participants used the full range of responses to each item (1–7) with the exception of the following item for which the range was 2–7: ‘Patients value a healthcare provider’s understanding of their feelings that is therapeutic in its own right’. The item mean scores ranged from a low of 3.77 for the following item: ‘Healthcare providers should not allow themselves to be influenced by strong personal bonds between their patients and their family members’, to a high of 6.4 for this item ‘I believe that empathy is an important factor in patients’ treatment’. Item standard deviations ranged from 1.1 to 1.7.

Table I. Descriptive statistics of reliability coefficients of the Jefferson Scale of Empathy for Health Professions Students (JSE-HP-S) version.

<table>
<thead>
<tr>
<th>Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>111.5</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>12.2</td>
</tr>
<tr>
<td>25th percentile</td>
<td>104</td>
</tr>
<tr>
<td>50th percentile</td>
<td>113</td>
</tr>
<tr>
<td>75th percentile</td>
<td>120</td>
</tr>
<tr>
<td>Range</td>
<td>59–137</td>
</tr>
<tr>
<td>Alpha reliability coefficient</td>
<td>0.78</td>
</tr>
<tr>
<td>Test-retest reliability (3-month interval)*</td>
<td>0.58</td>
</tr>
<tr>
<td>Test-retest reliability (6-month interval)†</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*Test-retest reliability for 99 students (time interval between testing was approximately 3 months).
†Test-retest reliability for 30 students (time interval between testing was approximately 6 months).

The item-total score correlations ranged from a low of 0.09 to a high of 0.62, with a median of 0.42. All were statistically significant with the exception of one item (r = 0.09, p = 0.11), that was the same item with the lowest mean score reported previously. The highest item-total score correlation (r = 0.62) was obtained for the following item: ‘Healthcare providers’ understanding of the emotional status of their patients, as well as that of their families is one important component of the healthcare provider–patient relationship’.

Descriptive statistics and reliability coefficients
Total empathy scores ranged from a low of 59 to a high of 137 (possible range of 20–140), with a mean of 111.4, median of 113, and standard deviation of 12.2 (Table I). The internal consistency of the scale (Cronbach’s coefficient α) was 0.78 which falls within the generally agreed standard for Cronbach’s α of 0.7 or above (De Vellis, 1991). Test-retest reliability coefficient was 0.58 for 99 students who completed the second empathy scale within a 3-month period, and 0.69 for 30 students who completed a second scale within 6 months (see Table I).

Gender and age differences
Women (n = 233) and men (n = 32) were compared on their empathy scores. Women’s mean score (M = 112.5) was higher than men’s (M = 104.1). The gender difference was statistically significant (t(263) = 3.76, p = 0.0002) (see Table II), and also of practical importance (effect size = 0.65).

We compared students on their empathy scores in three age categories (Table II). There was no significant difference on empathy scores between those who were 20–29 years old (M = 109.7) and those who were 30–39 years old (M = 113.7). However, students who were 40 years and older obtained statistically significant higher empathy scores (M = 118.4) than the two younger groups (F(2,262) = 7.9, p = 0.0004).

Other group differences
We found no significant associations between empathy scores and the following variables: (1) previous college degrees (BS vs. MS/PHD vs. Other degrees), (2) ethnicity
Table II. Group comparisons on empathy scores*.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Statistic (group difference)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 32)</td>
<td>104.1</td>
<td>17.1</td>
<td>$t_{(265)} = 3.76$ (Female &gt; Male)</td>
</tr>
<tr>
<td>Female (n = 233)</td>
<td>112.5</td>
<td>11.0</td>
<td>$p = 0.0002$</td>
</tr>
<tr>
<td><strong>By age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–29 years (n = 181)</td>
<td>109.7</td>
<td>12.5</td>
<td>$t_{(263)} = 3.76$ (Female &gt; Male)</td>
</tr>
<tr>
<td>30–39 years (n = 54)</td>
<td>113.7</td>
<td>10.5</td>
<td>$p = 0.0004$</td>
</tr>
<tr>
<td>40 years and older (n = 30)</td>
<td>118.4</td>
<td>10.4</td>
<td>$F_{(2,262)} = 7.9$ (Group 3 &gt; 1 = 2)</td>
</tr>
<tr>
<td><strong>By education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS (n = 78)</td>
<td>112.1</td>
<td>11.5</td>
<td>$p = 0.81$</td>
</tr>
<tr>
<td>MS/PhD (n = 7)</td>
<td>113.3</td>
<td>5.8</td>
<td>$F_{(2,234)} = 0.21$ (Non-significant)</td>
</tr>
<tr>
<td>Others (n = 152)</td>
<td>111.1</td>
<td>13.0</td>
<td>$p = 0.08$</td>
</tr>
<tr>
<td><strong>By ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (n = 180)</td>
<td>111.7</td>
<td>12.0</td>
<td>$F_{(2,258)} = 2.53$ (Non-significant)</td>
</tr>
<tr>
<td>African-American (n = 52)</td>
<td>113.5</td>
<td>10.2</td>
<td>$p = 0.08$</td>
</tr>
<tr>
<td>Other (n = 29)</td>
<td>107.5</td>
<td>15.8</td>
<td>$p = 0.74$</td>
</tr>
<tr>
<td><strong>By religiosity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (n = 200)</td>
<td>111.5</td>
<td>12.4</td>
<td>$p = 0.33$</td>
</tr>
<tr>
<td>No (n = 62)</td>
<td>112.1</td>
<td>11.5</td>
<td>$F_{(2,260)} = 0.73$ (Non-significant)</td>
</tr>
<tr>
<td><strong>By program</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSN (n = 233)</td>
<td>111.5</td>
<td>12.2</td>
<td>$p = 0.48$</td>
</tr>
<tr>
<td>LPN-BSN (n = 3)</td>
<td>120.0</td>
<td>12.6</td>
<td>$F_{(2,260)} = 0.73$ (Non-significant)</td>
</tr>
<tr>
<td>RN-BSN (n = 27)</td>
<td>111.1</td>
<td>12.7</td>
<td>$p &lt; 0.1$</td>
</tr>
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<td></td>
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</tbody>
</table>
* Number of observations varies slightly in different analyses due to missing data.
$^1p < 0.1$.
$^2$The number of students is too small to provide statistical significance.

The findings of our study provide evidence in support of psychometrics of the newly modified JSPE-HPS version. For example, the positive and statistically significant item-total score correlations confirmed the correct direction of scoring and significant contribution of at least 19 (out of 20) items to the total score of the scale. Further statistical analysis with different samples of health professions students is needed to examine whether the single item with statistically insignificant item-total score correlations needs additional modifications.

Descriptive statistics of the revised version used in this study are comparable to those reported for medical students (Hojat et al., 2001) and undergraduate nursing students (Ward et al., 2009). In this study, Ward et al. used a different version of the scale specifically adapted for nursing students, and a mean of 114 (SD = 11.5) was reported which is not substantially different from that in our study.

The finding of gender difference on empathy in favor of women observed in this study is consistent with previous research in which earlier versions of the JSPE were used with samples of physicians (Hojat et al., 2002b); medical students (Hojat et al., 2001, 2002a); and nursing students (Ward et al., 2009).

For the most part, gender findings by other researchers using self-report scales are consistent with our findings (Harlak et al., 2008; Lennon & Eisenberg, 1987). However, the new neuroimaging techniques mentioned earlier are providing much more specific information supporting commonly held assumptions about gender differences. Derntl et al. (2010) reported results of a multidimensional study including functional MRI and a self-report questionnaire showing that females and males rely on divergent processing strategies when solving emotional tasks: while females seem to recruit more emotion-related regions of the brain, males activate more cortical or cognitive-related areas. Han, Fan, and Mao (2008) examined gender differences in empathy for pain in an electrophysiological study in Beijing, Peoples’ Republic of China, and provided evidence for differences in both the early and late components of empathic process between the two sexes, which is consistent with our findings.

The age differences reported in this study are in contrast to those observed among medical students in which no significant relationship was found between empathy scores and age (Hojat, 2007). A wider range and more variation in age distribution in the sample of nursing students in the present study may explain the different finding on students’ age and empathy scores. The age heterogeneity in nursing students could also be due to the fact that some enter nursing education as a second career.

The magnitudes of $r$ reliability coefficients suggest that the Scale is internally consistent (De Villis, 1991). The test-retest reliability coefficients indicate that the scales scores are relatively stable over approximately 3–6 months. The score stability was found despite the fact that in comparing test and retest scores we noticed change in empathy mean scores.

**Limitations**

The convenience sample of the participants limits the generalizability of the study. Another limitation may be that the study participants included only upper division baccalaureate nursing students in the health professions field.
In addition, since this study was conducted in a single public institution in one geographic location, the external validity or generalization of the findings may be jeopardized.

CONCLUSIONS

Despite the cited limitations, the results of the present study in support of measurement properties of the JSE-HPS version are encouraging. Because the JSE-HPS version was intended to be administered to diverse health professions students, it is desirable to examine the psychometrics of the scale in a broader population that includes samples of health professions students in other majors, in addition to nursing students. The current findings may bolster the confidence of researchers in using the Scale for measuring empathy in students of diverse health professions, for program evaluation as well as for outcome assessment of interprofessional learning and collaboration. Given the strong trend and even a mandate toward interprofessional collaboration in healthcare systems globally by the World Health Organization (WHO, 2010), there is a need to translate, validate, and use measures of interpersonal relationships in different cultures and healthcare professions. The availability of the JSE-HPS can help researchers in different health professions and different cultures to use the instrument in cross-cultural studies.

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Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this manuscript.

Note

1. A copy of the JSE-HPS is available upon request from the corresponding author.

REFERENCES


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