Article

Psychometrics of the student version of the Jefferson Scale of Physician Empathy (JSPE-S) in final-year medical students in Johannesburg in 2008

Kantilal Vallabh, BSc Hons, MB BCh, MSc (Med)

Steve Biko Centre for Bioethics, School of Clinical Medicine, University of the Witwatersrand, Johannesburg, South Africa

Corresponding author: *K Vallabh (kvallabh@gpnet.net)*

Background. In selecting medical students for medical school, there is interest in predictors other than examination scores. This is motivated by the concern that the selection processes, mainly based on academic attainment, appear to disadvantage some applicants. There is increasing recognition that empathy and communicating skills are important for doctors.

Aims. To assess empathy levels in final-year medical students in Johannesburg and to examine the psychometrics of the student version of the Jefferson Scale of Physician Empathy (JSPE-S).

Methods. Empathy level was assessed in 158 final-year medical students using the JSPE-S at the University of the Witwatersrand Medical School in 2008. Gender, age and prior degree/s were used as confounders.

Results. The mean empathy score in final-year medical students was 107 (standard deviation (SD) 10.9). The mean empathy score was higher in 95 female students than in 63 male students (109 SD 9.8 v. 104 SD 12) (t=2.51; p<0.013). The inter-item score correlations were positive and statistically significant. Cronbach's coefficient alpha was 0.79. Factor analysis using principal component analysis identified three factors that are generally consistent with the grand conceptual aspects of the notion of empathy in the JSPE-S (viz. perspective taking, compassionate care and standing in the patient's shoes).

Conclusion. The results indicate that the mean empathy scores and psychometrics of the JSPE-S among final-year medical students in Johannesburg, South Africa are similar to studies published among students in America and Europe and that the scores are higher than those published in studies of students in Asia.

Empathy, while remaining an elusive concept, has recently gained a respected role in psychotherapy and medical interviewing. Empathy has been much discussed in the psychological literature of the early decades of the 20th century.[1,2] The therapeutic relationship between doctor and patient is an integral part of healing and effective medical care.[3] Empathy is intuitively an important consideration in medical practice and the care of patients. The concept of empathy, however, is elusive, theoretically and operationally. Empathy is commonly contrasted with sympathy, whereby empathy is said to refer more to a cognitive understanding of a patient's situation and feelings, and sympathy is used to refer to a sharing and feeling of the patient's emotions.

According to Spiro[4] 'it really doesn't matter whether empathy is a thought or an emotion. Retaining or enhancing it in medical caregivers is worth doing and may be achieved through: (1) the selection of medical students and others who will care for the sick, (2) the training caretakers receive, and more fundamentally even, (3) reconsideration of what doctors do in a world so much changed and so diverse.' Partly because of biotechnological developments and partly because of the changes in the healthcare system, it has been argued that in the contemporary system of medical education and patient care, insufficient attention is paid to human aspects of medical education and patient care. Given this universal trend, it is important and timely to study factors that contribute to improving interpersonal relationships in the context of medical education and patient care.

'While there may not be an inherent conflict between technology and humanism, it does seem that the human dimension of medicine has been diminished.'[5] Social changes have led to new needs that require changes to develop an 'effective' physician with appropriate skills including empathic capacity.[6]

Medical education and medical practice emphasise the scientific method to address illness and suffering. Instead of observing and touching the patient directly, scientific advances substitute technology for personal closeness. Physicians are losing their skills to talk and listen to their patients.

Medical students experience medical education and training as stressful. Their reliance on technology for diagnosis, and limited bedside interactions with patients may contribute to a decline in empathy. Empathy is critical to the development of professionalism in medical students as they progress through their training. Medical students' personal attitudes towards various vulnerable groups of patients (e.g. the elderly, the dying, the underserved, refugees, illegal immigrants, prisoners, drug and alcohol abusers, etc.) can impact on the quality of healthcare they deliver to these patients.[7] As identified by Rosenfield and Jones,[8] 'Medical students face many challenges in their training. One of these is to learn how to manage the stresses and anxiety of confronting illness and suffering in patients. They may develop maladaptive responses that lead to a decrease in their level of empathy for patients.'

Empathy is believed to be measurable and teachable and has been incorporated formally in some medical curricula.[8-14]

Research on the subject is not abundant, because of the difficulty in formulating a definition of empathy. There are as many definitions of empathy as there are people working on the topic.[1] The absence of a reliable instrument to measure physician empathy in the clinical setting has also contributed to the paucity of research on empathy.[14]

Many instruments have been developed to measure empathy in various settings. Each instrument measures a specific aspect of empathy. Stepien and Baerntein[15] and Hemmerdinger *et al*.[16] found that instruments developed to measure empathy were measuring the affective behaviour or aspects of behaviour relevant to the specific study.

The JSPE is the most widely researched test and was specifically designed by researchers from scratch for the assessment of physician and student empathy. This scale was originally developed to measure the attitudes of medical students towards physician empathy in patient-care situations (JSPE-Student or S-version). The JSPE has been translated into 25 languages including Belgian, Brazilian, Chinese, Chilean, Dutch, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Lithuanian, Norwegian, Persian, Peruvian, Filipino, Polish, Portuguese, Romanian, Spanish, Taiwanese and Turkish.

Material and methods

This is a one-shot cross-sectional survey of final-year students in the Faculty of Health Sciences, University of the Witwatersrand Medical School, in 2008. There was no reward for participating, nor any penalty for not participating in the survey.

Of the final-year class of 244 students (101 male (41.4%) and 143 female (58.6%)), only 158 (64.7%) students voluntarily and anonymously completed and returned the JSPE-S questionnaire.

The measuring instrument

The JSPE-S is a validated 20-item self-administered questionnaire answered on a 7-point Likert scale (strongly disagree = 1… strongly agree = 7). Of the 20 items in the JSPE-S, 10 items are positively worded and linked to 'perspective taking' and 10 items are negatively worded. Eight of the 10 negatively worded items are concerned with 'compassionate care' and the remaining 2 items are concerned with 'standing in the patient's shoes'.[22] The minimum possible score on the JSPE is 20 and the maximum possible score is 140. The higher score indicates a more empathic behavioural orientation.

Data management and analysis

The data were collected by means of the JSPE-S questionnaire. The JSPE-S responses were captured on an Excel spreadsheet and imported into STATA version 9.0 statistics package, from StataCorp LP. The data were treated with strict confidentiality.

Descriptive statistics were calculated by gender, age, and prior degree/s and no prior degree/s. Statistical significance was set at the 95% confidence level ($p<0.05$). Cronbach's coefficient alpha was calculated to assess the internal consistency aspect of reliability of the instrument. Further, empathy scores for male and female students were compared by using a *t*-test. Correlation between each item and the total score (item-score correlation) was calculated. The factorial structure of the JSPE-S was evaluated with rotated principal component factor analysis in Stata version 9. A number of factors were selected after examining the eigenvalues.

Results

Out of the class of 244 final-year students, 164 responded (67% of the class) and voluntarily returned the completed self-administered questionnaire (63 males and 95 females, 6 surveys were incomplete). Of the 164 completed surveys 6 were discarded because of missing demographic information. A mean score was calculated for each of the 20 statements. Five surveys with less than 4 missing responses were allocated a mean score for each of the statements that had missing responses. Sixty-one students indicated that they had a previous degree.

The mean class age was 25.3 years ($n=158$). The mean empathy score for the class was 107.0 (SD 10.9). The difference in the mean empathy scores between female students 109 (SD 9.8) and male students 104 (SD 12.1) is statistically significant ($t=2.51$; $p<0.013$).

Descriptive statistics by gender, age, prior degree and no prior degree are reported in Table I.

Table I. JSPE-S score distribution and descriptive statistics

Statistics	Count (*n*)	Minimum score	Maximum score	Mean score	Standard deviation
Age	158	21	38	25.3	2.59
Mean score of class	158	77	135	107.0	10.92
Score of female students	95	88	135	108.7	9.78
Score of male students	63	77	131	104.3	12.06
Score of female students with no degree	61	88	128	108.2	9.13
Score of male students with no degree	36	77	127	103.1	11.90
Score of female students with prior degree	34	88	135	109.7	10.93
Score of male students with prior degree	27	85	131	105.9	12.32
Score of students with no prior degree	97	77	128	106.3	10.47
Score of students with prior degree	61	85	135	108	11.62

Psychometrics of the JSPE-S

The mean item score responses ranged from a low of 3.5 for item 18 (reverse-scored) to a high of 6.4 for item 2.

These findings indicate that the students' responses tend to be skewed towards the upper end of the scale although they used the full range of possible responses on most items.

The inter-item score correlation was positive and statistically significant with a mean inter-item score correlation of 0.411 (SD 0.23).

Item-score correlation ranged from a low of 0.20 for two items – item 19 'I do not enjoy reading non-medical literature' (reverse-scored) and item 18 'Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members' – to a high of 0.61 for two items – item 16 'Physicians' understanding of the emotional status of their patients, as well as that of their families is one important component of the physician-patient relationship,' and item 20 'I believe that empathy is an important therapeutic factor in medical treatment'.

Inter-item reliability of the JSPE-S (Cronbach's coefficient alpha) was 0.79. Table II indicates the range of student responses to the statements as per the Likert scale and item-score correlation.

Factor analysis of the data was conducted to examine the underlying components (factors) of the JSPE-S. Principal component factor analysis with orthogonal rotation was used to obtain a simpler factor structure. Six factors of eigenvalue of >1 were produced (viz. 4.83, 1.74, 1.40, 1.25, 1.15, and 1.10). These six factors accounted for 54% of the total variance.

The three factors with the largest eigenvalues were retained for orthogonal rotation. These three factors accounted for 40% of the total variance. The first factor accounted for 16 %, the second factor 15%, and the third factor 9% of the total variance. Based on the contents of the statements in the JSPE-S, three grand factors were identified: perspective taking, compassionate care and standing in the patient's shoes.[14]

Factor 1 loaded seven items with a factor coefficient of greater than 0.35 for statements related to understanding from physician's perspective (perspective taking) and the one item of standing in patient's shoes.

Factor 2 loaded eight items with a factor coefficient of greater than 0.35 for statements reverse-scored and related to emotion and feelings (compassionate care).

Factor 3 loaded two items with a factor coefficient of greater than 0.35 related to standing in the patient's shoes.

Items 19, 10 and 18 did not load a factor coefficient greater than 0.35. These three items are related to reading non-medical

Table II. Range of responses to statements on Likert scale and item-score correlation for the 10 positively worded and 10 negatively worded items

Likert scale responses to statements (R is negatively worded)	Range of responses selected on Likert scale	Mean score per statement	SD of responses on Likert scale	Item-total score correlation
1 R	1 - 7	5.5*	1.63	0.362
2	4 - 7	6.4	0.81	0.448
3 R	1 - 7	4.5*	1.44	0.441
4	4 - 7	6.1	0.98	0.414
5	1 - 7	5.0	1.53	0.435
6 R	1 - 7	4.6*	1.57	0.397
7 R	1 - 7	5.9*	1.43	0.514
8 R	1 - 7	5.7*	1.21	0.493
9	1 - 7	5.5	1.36	0.512
10	1 - 7	5.7	1.31	0.551
11 R	1 - 6	6.0*	1.14	0.569
12 R	1 - 7	5.9*	1.36	0.501
13	1 - 7	5.6	1.37	0.548
14 R	1 - 6	6.0*	1.15	0.687
15	1 - 7	5.3	1.63	0.480
16	3 - 7	5.9	1.14	0.608
17	1 - 7	4.4	1.68	0.363
18 R	1 - 7	3.5*	1.66	0.208
19 R	1 - 7	5.8*	1.68	0.209
20	1 - 7	6.1	1.18	0.607

*Reverse-scored.

literature, patients' perception of physician's understanding their feelings and physicians being influenced by the family bonds of patients.

Factor coefficients greater than 0.35 are highlighted, for the 10 positively worded and 10 negatively worded items, after reverse-scoring (R) and are reported in Fig. 1.

Discussion

Evidence in support of the psychometrics (e.g. construct validity, criterion-related validity, test-retest reliability and coefficient alpha reliability) of the JSPE-S scale among medical students, registrars and physicians has been reported.[17-24] The mean empathy score of 107 in this study is comparable to the average empathy scores of 109 - 114 reported by Chen *et al.*[25] Garza *et al.*[21] and Mangione *et al.*[26] among medical and pharmacy students. Roh *et al.*[17] and Kataoka *et al.*[18] however report a lower mean empathy score of 103 in Korean and Japanese medical students, respectively.

It is known that cross-cultural differences in norms, ethnicity, religious beliefs, and sex stereotyping can influence empathic engagement during clinical encounters. Morling and Lamoreaux[27] have reported that Asians have more collectivistic and less individualistic social cultures than Westerners. South Africa having gone through various phases of Dutch and British colonisation has a predominantly Western social culture although some Asian and African influence is also present among our 'rainbow nation'.

	Factor 1	Factor 2	Factor 3
16. Physicians' understanding of the emotional status of their patients, as well as that of their families is one important component of the physician-patient relationship.	0.682	0.25	0.109
17. Physicians should try to think like their patients in order to render better care.	0.658	-0.168	0.023
5. A physician's sense of humor contributes to a better clinical outcome.	0.588	0.098	-0.101
9. Physicians should try to stand in their patients' shoes when providing care for them.	0.565	0.171	0.110
20. I believe that empathy is an important therapeutic factor in medical treatment.	0.547	0.306	0.224
13. Physicians should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language.	0.534	0.137	0.363
2. Patients feel better when their physicians understand their feelings.	0.406	0.249	0.184
7. Attention to patients' emotions is not important in history taking.	0.056	0.667	0.053
14. I believe that emotion has no place in the treatment of medical illness.	0.322	0.644	0.239
11. Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence in medical or surgical treatment.	0.115	0.628	0.293
1. Physicians understanding of their patients' feelings and the feelings of their patients' family's does not influence medical or surgical treatment.	-0.109	0.581	0.040
12. Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints.	0.207	0.571	0.029
8. Attentiveness to patients' experiences does not influence treatment outcomes.	0.205	0.549	0.044
4. Understanding body language is as important as verbal communication in the physician-patient relationship.	0.264	0.481	-0.130
15. Empathy is a therapeutic skill without which the physician's success is limited.	0.318	0.360	-0.046
6. Because people are different, it is difficult to see things from patients' perspectives.	0.044	0.081	0.817
3. It is difficult for a physician to view things from patients' perspectives.	0.145	0.084	0.777
19. I do not enjoy reading non-medical literature or the arts.	-0.192	0.215	0.221
18. Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members.	0.104	-0.293	0.122
10. Patients value a physician's understanding of their feelings which is therapeutic in its own right.	-0.579	-0.227	-0.190
Eigenvalue	4.8	1.74	1.41
% variance	16	15	9

Fig. 1. Rotated factor analysis of the JSPE-S based on responses of 158 students. Factor coefficients greater than 0.35 are highlighted for the three factors. Data were analysed with principal-component factor analysis with orthogonal rotation. Items are listed by their factor loadings size within each factor. Items were scored based on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), except reverse-scored items (items 1, 3, 6, 7, 8, 11, 12, 14, 18, 19). Reprinted with permission from Dr M Hojat, Jefferson Medical College, Thomas Jefferson University.

The gender distribution in the Johannesburg final-year class was 58.6% female; this compares with 60% reported by Looi[28] for the USA medical schools. The difference in the mean empathy scores between female students (109, SD 9.8) and male students (104, SD 12.1) is statistically significant (t=2.51, p<0.013). This is consistent with the findings

of other researchers[6,18,25,29-31] Women have been reported to have greater empathy than men, are more receptive to emotional signals and offer more emotional support and patient-orientated care, possibly because they tend to value interpersonal relationships highly and have more competent understanding of emotions and caring attitude.[23,25,32,33] However, one study in Italy has not indicated a significant difference in empathy scores between genders. Further research is needed to determine whether this may be due to cultural peculiarities, translation of the scale or sampling.[34]

Factor analysis does not reveal a value greater than 0.35 for any of the three factors for items 19, 10 and 18 (Table II). The study among Korean and Japanese medical students also revealed a factor loading of less than 0.35 for item 19.[18,19] Looi[28] argues that instruments assessing empathy may be impacted by value judgments, cultural considerations and cognitive styles. Commenting on the JSPE-HP version he cites item 19 on reading non-medical literature and enjoying the arts as enhancing the ability to render care and not necessarily empathy. He asks whether it measures what we mean by empathy or are we assessing the perception of empathy by physicians, patients and the public?

The literature in social and developmental psychology indicates that compassion, altruism and empathy are related and are relatively stable personality traits and are not easily amenable to change.[35] Other researchers report that empathy is a state (like mood) and is amenable to change during and after training.[26,32,36] Studies to date are not consistent regarding changes in empathy by intervention. Further research on this subject is required.

Conclusion

There is a need for systematic training of humanistic qualities in medical education. Emphatic skills are not automatically acquired during clinical training and the development of empathy may be impeded by hurried fragmented patient care and emphasis on clinical detachment or affective distance or equanimity.

The measurement of empathy should be pursued during pre-clinical and clinical years of training.

This study has some limitations. First, the possibility of cohort effects cannot be dismissed in this study. Given that the findings are based on a single cross-sectional design in which baseline differences could not be controlled, a longitudinal cohort study should be conducted in the future to examine whether such differences exist and to confirm the validity of the results. Second, although the JSPE was reported to be well correlated with observer ratings,[21] there is a possibility that self-reports may be subjected to unwitting biases and discrepancies between self-reflection and actual behaviour may exist. Third, the survey was conducted in only 1 year at a single medical school in South Africa. This potentially limits the generalisation of the findings to South African medical students. This is the first study that examines the 'empathy dimension' among a group of South African medical students. However, more research is needed for better characterisation of the effect of medical education on medical students' empathic skills. Additional studies are needed to elucidate the role of cultures in our 'rainbow nation' and the impact of medical education curriculum on empathy.

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