Measurement of Perceived Physician Empathy in Orthopedic Patients

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Abstract

Background: Empathy is a key component of a therapeutic relationship. Perceived empathy and compassion are associated with patient satisfaction, reduced symptoms, and adherence to treatment. **Objective:** To assess the advantages and disadvantages of the validated Jefferson Scale of Patient's Perception of Physician Empathy (JSPPPE) and the Consultation and Relational Empathy (CARE) tools. **Methods:** Eighty-four patients completed the JSPPPE and the CARE measure. With Pearson's correlation and exploratory factor analysis, we measured the underlying construct. Flooring and ceiling effects were measured. Multivariable models were created to assess factors associated with both measures. **Results:** The high inter-questionnaire correlation (rho = 0.70) and factor loading (0.77) confirm that the JSPPPE and CARE measure the same construct. The CARE (55%) had a higher ceiling effect than JSPPPE (18%). Both JSPPPE (partial R^2 = 0.53, 95% confidence interval [CI]: 0.38-0.64) and CARE (partial R^2 = 0.60, 95% CI: 0.46-0.69) accounted for similar amounts of variation in satisfaction with the orthopedic surgeon. **Conclusion:** Perceived empathy accounts for a substantial amount of the variation in satisfaction. The JSPPPE measures the same construct as CARE with a lower ceiling effect. Because both questionnaires have considerable ceiling effects, a new questionnaire might help to study factors associated with a more empathetic experience.

Keywords

empathy, measurements, patient satisfaction, PREMs, PROMs

Introduction

Hippocrates wrote that "the patient, though conscious that his condition is perilous, may recover his health that simply through his contentment with the goodness of the physician." In 1955, Balint stated that improvement in health was based on "not only the medicine . . . or the pills . . . but the way the doctor gave them to the patient—in fact the whole atmosphere in which the drug was given." Current placebo science confirms the ability of a supportive doctor–patient relationship to relieve symptoms and decrease physical limitations (1–3). Patients rate communication as one of the top three competencies they desire in a physician but frequently rated their own physicians' communication skills as unsatisfactory (4). In 1997, Suchman et al found frequent missed opportunities to acknowledge emotional concern during interviews (missed empathic opportunities): Physicians tend to direct the conversation to exploration of symptoms (4). Orthopedic surgeons have an opportunity to improve health by improving their empathy and communication skills (4–7).

Effective communication strategies that convey empathy and compassion are associated with (4,8,9) (1) greater patient satisfaction and adherence to treatment (10,11), (2) reduced symptoms and psychosocial concerns and enhanced recovery from illness (12,13), (3) greater patient disclosure of medical and psychosocial information contributing to more accurate diagnosis (14,15), (4) reduced risks of malpractice claims in case of medical errors (16,17), and (5) greater job satisfaction and less stress and burnout among physicians (16,18).

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There has been much confusion around the precise definition of empathy (eg, knowing another's emotional and cognitive state, projecting oneself into another's situation, or feeling for another person who is suffering) (19). In general, "empathy involves an inductive affective (feeling) and cognitive evaluative (knowing) process that allows the individual to vicariously experience the feelings and understand the given situation of another" (19). Because of this, existing measures of empathy are often unrelated to each other and may measure different variables (ie, affection versus cognition). Evidence in medicine and psychotherapy both suggest that patient-rated empathy (ie, second-person assessment) is most reliably associated with better therapeutic outcomes (15,20–23). A systematic review by Hemmerdinger et al in 2007 evaluated 5 second-person empathy measures and concluded that the Consultation and Relational Empathy (CARE) measure—a 10 question measure—was the only one with evidence of reliability, internal consistency, and validity (22,24–26). However, we have observed high ceiling effects (56%) with CARE, limiting the discriminatory potential of this measure (27). Another, more recently developed second-person measure of physician empathy that demonstrated validity and reliability similar to the CARE measure is the Jefferson Scale of Patient's Perception of Physician Empathy (JSPPPE)—a 5 question measure developed by Hojat and colleagues (28,29).

We wanted to know if the JSPPPE and CARE indeed measure the same underlying construct: patient perceived empathy, and which of the two is easier and more reliable to use in research. Therefore, this study evaluated the differences between these 2 measures of perceived physician empathy among patients seeking musculoskeletal care. Specifically, our primary study question evaluated the direct (Pearson's) correlation between the JSPPPE and CARE. Secondarily, we assessed (1) differences in flooring and ceiling effects and internal consistency of the questionnaires, (2) factors (eg, patient age, gender, or visit type) associated with JSPPPE and CARE and the amount of variation in empathy they account for, and (3) differences in the amount of variation in satisfaction with the orthopedic surgeon explained by JSPPPE and CARE.

Materials and Methods

This cross-sectional cohort study was deemed exempt from institutional review board review. All consecutive, new and established patients presenting to one of 5 orthopedic surgeons in various outpatient offices (3 orthopedic hand surgeons, 1 orthopedic trauma surgeon, and 1 orthopedic sports surgeon) were invited to participate in this study. Inclusion criteria were age 18 to 89 years old, ability to read and understand study material and questionnaires, and the verbal agreement to participate. Postoperative visits were excluded. No patient declined participation and each patient participated only once.

Measured Variables

Participants completed the questionnaires immediately after the visit with one of the 5 participating orthopedic surgeons. Survey completion was done in a private room to limit influence of clinicians and office staff on patient rating of perceived empathy. We measured sociodemographic and clinical variables: patient age, gender, highest level of education, employment status, marital status, visit type (new versus established patient), and visit diagnosis. Diagnosis was divided into 3 categories: trauma; nontrauma, pain; and nontrauma, other. Trauma was defined as an injury or damage caused by physical harm from an external source. Pain was considered a symptom of an underlying condition and was defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. The surgeon indicated the diagnostic category.

We included a subset of patient-reported outcome measures to quantify physical and psychological symptoms including the Patient-Reported Outcomes Measurement Information System (PROMIS) Physical Function (PF) computer adaptive test. PROMIS PF has a mean score of 50 points for the general population in the United States. A lower score indicates worse physical function (30); a 2-item short form of the Patient Health Questionnaire (PHQ-2) is scaled from 0 to 6, where a lower score indicates less self-reported depressive symptoms (31); and a 2-item short form of the Pain Self-Efficacy Questionnaire (PSEQ-2) is scaled from 0 to 12, where a lower score indicates less ability to carry out activities when in pain (32).

Two second-person measures of perceived physician empathy were used: The JSPPPE and the CARE.

The JSPPPE is a validated questionnaire that consists of 5 items (28,29): The doctor . . . (1) can view things from my perspective (see things as I see them); (2) asks about what is happening in my daily life; (3) seems concerned about me and my family; (4) understands my emotions, feelings, and concerns; (5) is an understanding doctor. Each item is answered on a 7-point Likert scale, with responses ranging from 1 (strongly disagree) to 7 (strongly agree). The sum of all responses is the total score, which ranges between 7 (lowest empathy) and 35 (highest empathy).

The CARE measure is a validated questionnaire that consists of 10 items (24–26,33): How was the doctor at . . . (1) making you feel at ease?; (2) letting you tell your "story"?; (3) really listening?; (4) being interested in you as a whole person?; (5) fully understanding your concerns?; (6) showing care and compassion?; (7) being positive?; (8) explaining things clearly?; (9) helping you take control?; (10) making a plan of action with you? Each item is answered on a 5-point Likert scale, with responses ranging from 1 (poor) to 5 (excellent) or "does not apply." The sum of all items is the total score, which ranges between 10 (lowest perceived empathy) and 50 (highest perceived empathy). In case of one or two "does not apply" responses on a single CARE measure, the mean score of the other items is imputed to

Table 1. Demographics of the Study Population.[a]

Number of patients, N	84 (100%)
Age (in years)	52 ± 17 (20-88)
Female	44 (52%)
Whites	59 (70%)
Highest educational degree	
High school/GED or some college	39 (46%)
Bachelor's degree	23 (27%)
Master's degree or advanced graduate work	22 (26%)
Employment status	
Currently employed	51 (61%)
Retired	22 (26%)
Other	11 (13%)
Marital status	
Single	22 (26%)
Married/remarried	50 (60%)
Divorced/separated or widowed	12 (14%)
Visit diagnosis	
Trauma	35 (42%)
Nontrauma; pain	41 (49%)
Nontrauma; other	8 (9.5%)
Follow-up patients	65 (77%)
Satisfaction	9.0 ± 1.2 (5–10)
JSPPPE	29 ± 5.2 (12–35)
CARE	46 ± 6.3 (22-50)
PROMIS Physical Function	45 ± 9.7 (23-73)
PHQ-2	1.1 ± 1.6 (0-6)
PSEQ-2	7.8 ± 2.7 (0-10)

Abbreviations: CARE, Consultation and Relational Empathy; JSPPPE, Jefferson Scale of Patient's Perception of Physician Empathy; PHQ, Patient Health Questionnaire; PROMIS, Patient-Reported Outcomes Measurement Information System; PSEQ, Pain Self-Efficacy Questionnaire.
[a]Discrete variables as frequency (percentage); continuous variables as mean ± standard deviation (range).

replace these responses. With more than 2 missing items, the survey is invalid.

Patient satisfaction with the orthopedic surgeon was measured using an 11-point numeric rating scale (0-10), anchored at each end by opposite statements, which were "worst doctor" (0) versus "best doctor" (10) (34).

Study Cohort

The mean age of the study cohort (N = 84) was 52 years (standard deviation [SD]: 17 years, range: 20-88 years) and 44 patients (52%) were female. Sixty-five (77%) patients were established and came in for a follow-up visit. Forty-one (49%) patients sought care for a "nontraumatic, but painful condition of the musculoskeletal system" (including conditions such as carpal tunnel syndrome, arthritis, tendinopathy, that is, epicondylitis and De Quervain tendinopathy; Table 1).

Statistical Analysis

Variables are reported using mean, SD and range, or number and proportion. Fisher exact test was used to determine the differences between 2 categorical variables. We used Student *t* tests or one-way analysis of variance for continuous

and dichotomous or categorical variables, and Pearson correlation for 2 continuous variables.

Additionally, we used exploratory factor analysis to assess if JSPPPE and CARE measure the same underlying construct (ie, perceived empathy). A factor score of 1 indicates perfect correlation of the questionnaire with the underlying trait and 0 indicates no correlation.

We defined the flooring effect as the percentage of empathy ratings at the lowest possible score and ceiling effect as the percentage of ratings at the highest possible score. Nine times in 7 patients (1.1%), the option "does not apply" was chosen for the CARE measure. Therefore, the mean score of the other items was imputed to replace these responses. We evaluated the internal consistency of the questionnaires using Cronbach's alpha.

To determine what factors were associated with JSPPPE and CARE scores and the amount of variation they explain, we standardized both empathy measures to a mean of 0 with an SD of 1 and created 2 multivariable models including all independent variables with $P < .10$ on bivariate analysis (Online Appendix 1, Tables 5 and 6).

To assess the difference in the amount of variation in satisfaction explained by JSPPPE and CARE, we created 2 multivariable models for satisfaction: one with standardized JSPPPE and one with standardized CARE. Both models included all independent variables with $P < .10$ on bivariate analysis (Online Appendix 2, Table 7).

We compared the amount of variation explained by the partial R^2 (R^2; partial correlation). We regarded nonoverlapping confidence intervals (CIs) as a significant difference. Otherwise, we perceived $P < .05$ as significant.

Sample Size Calculation

An a priori power analysis suggested that a cohort of 82 patients would provide 80% power to detect a medium correlation (rho = 0.3) between the JSPPPE and CARE with alpha set at 0.05.

Results

Correlation of JSPPPE and CARE

Both JSPPPE and CARE were strongly correlated ($r = 0.70$, $P < .001$; Table 2).

Exploratory Factor Analysis

Both questionnaires had a factor loading of 0.77, indicating that they measure a common underlying trait (Table 2).

Differences in Flooring and Ceiling Effects and Internal Consistency

Neither JSPPPE nor CARE had a flooring effect. The ceiling effect of CARE (55% [46/84]) was notably greater than for JSPPPE (18% [15/84]). Cronbach's alpha for both JSPPPE

Table 2. Correlation and Factor Loadings of Empathy Questionnaires.[a]

Correlation[b]

Variable 1	Variable 2 CARE	P Value
JSPPPE	0.70	**<.001**

Factor loading[c]

Variables	Factor 1 (underlying trait)
JSPPPE	0.77
CARE	0.77

Abbreviations: CARE, Consultation And Relational Empathy; JSPPPE, Jefferson Scale of Patient's Perception of Physician Empathy.
[a]Bold indicates statistically significant difference ($P < .05$).
[b]Pearson's correlation.
[c]Factor loadings from explanatory factor analysis measuring the underlying trait.

(0.94) and CARE (0.97) was high, indicating excellent internal consistency (Table 3).

Variation in Empathy Explained

No independent variables (eg, marital status or visit type) were significantly associated with variation in standardized JSPPPE or CARE on multivariable analysis (Online Appendix 3; Tables 8 and 9).

Variation in Patient Satisfaction Explained

There was no difference in the variation of satisfaction with the surgeon explained by JSPPPE (partial $R^2 = 0.53$, 95% CI: 0.38-0.64) and CARE (partial $R^2 = 0.60$, 95% CI: 0.46-0.69) (Online Appendix 4, Tables 10 and 11). Greater standardized JSPPPE (greater empathy) was associated with greater satisfaction (beta coefficient [β]: 0.86, 95% CI: 0.67-1.0, $P < .001$, partial $R^2 = 0.53$, 95% CI: 0.38-0.64). Married patients had greater satisfaction compared to single patients (β = 0.54, 95% CI: 0.063-1.0, $P = .027$, partial $R^2 = 0.062$, 95% CI: 0-0.19) (Table 4; model 1). Greater standardized CARE (greater empathy) was associated with greater satisfaction (β = 0.93, 95% CI: 0.76-1.1, $P < .001$, partial $R^2 = 0.60$, 95% CI: 0.46-0.69). New patients were less satisfied (β = −0.79, 95% CI: −1.2 to −0.39, $P < .01$, partial $R^2 = 0.17$, 95% CI: 0.046-0.32; Table 4; model 2).

Discussion

Empathy is considered to be a key component of a therapeutic relationship that enhances health (12,15,23). There is variation in empathy definitions and heterogenicity in empathy measures (empathy may include moral, cognitive, emotive, and behavioral components) (22,23). The JSPPPE and CARE are valid and reliable empathy measures, but there is no data comparing them. Finding the best measure, with the least censoring, and that can be completed in a short amount of time, can improve our understanding of patient perceptions and can reduce survey burden. We found that the JSPPPE and CARE measures were strongly correlated and had a high—and identical—factor loading, suggesting that these questionnaires measure the same underlying construct, that is, perceived empathy. The JSPPPE showed better distribution and had a significantly lower ceiling effect.

These results are to be interpreted with the following limitations in mind. Both JSPPPE and CARE were initially developed and validated in a primary health-care setting with general practitioners (24,25,28,29). However, the CARE measure has been extensively validated with a range of physician groups in both primary and specialty care (26,33). The JSPPPE has not been validated in specialty care, but the developers suggest that the questionnaire can be used to assess empathic engagement in a wide range of clinicians, including specialists (35). External validity is limited by the fact that we enrolled patients with musculoskeletal illness, who were fluent in English and literate, and seeing one of 5 white, male orthopedic surgeons. There is evidence that clinician gender, ethnicity, and specialty and patient language and race affect perceived empathy (36,37). Another possible limitation of the study was that we did not randomize the delivery order of the questionnaires. All patients completed the questionnaires in the same order, starting with the demographics, the psychological measures, and the PROMIS PF computer adaptive test, followed by the empathy and satisfaction measures. The total load of questionnaires and possible similarities of questions in our empathy measures might have annoyed the patients, resulting in less representative answers or lead to survey fatigue. The CARE was always the first instrument measured, followed by the JSPPPE and the patient satisfaction score. Since we only compared 2 measures of physician empathy with a total of 15 questions, we assumed this effect to be low.

The strong correlation between the JSPPPE and CARE indicates that both questionnaires measure the same construct. This is supported by the demonstration of a high and identical factor loading, with only one underlying factor (physician empathy). This indicates that the underlying construct measured by the JSPPPE and CARE is identical in patients with musculoskeletal illness. In other research, CARE demonstrated a high correlation with other second-person empathy measures ($r > 80$), supporting its divergent and convergent validity: Barrett-Lennard Relationship Inventory Empathy subscale ($r = 0.84$), Reynolds' Empathy Scale ($r = 0.85$), and Barrett-Lennard Empathy subscale ($r = 0.84$). These measures however showed less evidence in terms of reliability, internal consistency, and validity (22,24).To the best of our knowledge, the JSPPPE has never been compared to the widely accepted CARE measure.

The CARE measure had a notably greater ceiling effect (55%) than the JSPPPE (18%), meaning that CARE had a limited ability to discriminate variations in high perceived empathy (27). In the validation studies of the CARE measure, the ceiling effect of 26% was considerably lower (24).

Table 3. Item Completion Rate, Floor and Ceiling Effect, and Score Distribution per Empathy Questionnaire.

Questionnaire	Number of Items	Item Completion Rate (%)	Mean (SD)	Range	Possible Range	Cronbach's Alpha	Flooring Effect, n (%)	Ceiling Effect, n (%)
JSPPPE	5	100	29 (5.2)	12 to 35	5 to 35	0.94	0 (0)	15 (18)
CARE	10	98.9	46 (6.3)	22 to 50	10 to 50	0.97	0 (0)	46 (55)

Abbreviations: CARE, Consultation And Relational Empathy; JSPPPE, Jefferson Scale of Patient's Perception of Physician Empathy.

Table 4. Multivariable Analysis of Factors Associated With Patient Satisfaction.[a]

Variables[b]	β Regression Coefficient (95% Confidence Interval)	Standard Error	P Value	Partial R^2 (95% Confidence Interval)	Adjusted R^2
Model 1					0.58
Standardized JSPPPE	0.86 (0.67 to 1.0)	0.091	**<.001**	0.53 (0.38 to 0.64)	
Marital status					
Single	Reference				
Married/remarried	0.54 (0.063 to 1.0)	0.24	**.027**	0.062 (0 to 0.19)	
Model 2					0.64
Standardized CARE	0.93 (0.76 to 1.1)	0.087	**<.001**	0.60 (0.46 to 0.69)	
Visit type					
Follow-up	Reference				
New patient	− 0.79 (−1.2 to −0.39)	0.19	**<.001**	0.17 (0.046 to 0.32)	

Abbreviations: CARE, Consultation And Relational Empathy; JSPPPE, Jefferson Scale of Patient's Perception of Physician Empathy.
[a]Bold indicates statistical significance, $P < 0.05$.
[b]Only statistically significant variables are shown.

Later studies by the developer of the CARE measure demonstrated widely varying ceiling effects, ranging from 0% in patients visiting Chinese primary health-care clinics to 48% in primary care nurses (38,39). The high Cronbach's alpha for both questionnaires confirms high internal consistency in patients seeking care for a musculoskeletal problem and is in line with previous evidence (24–26,40). For example, the preliminary validation of the CARE found an internal consistency of 0.92 (24). Although the CARE measure incorporates "does not apply" as an answer option in its questions, there was a relatively low "does not apply" responses (n = 9, 1.1%). All "does not apply" responses were explained by 3 of 10 items: item 4 (n = 2), item 9 (n = 5), and item 10 (n = 2), respectively. This low percentage is in line with previous research (24,25). Methods for how to deal with this "missing data" in analyses may lead to problems such as a decrease in precision. Often missing values are replaced with values imputed from the observed data (eg the mean of the observed values)—as is the method described for the CARE measure. However, mean imputation has a greater potential for bias, as it does not correct for the other observed values.

Neither the JSPPPE nor the CARE measures varied by demographics, diagnosis, or psychological factors, indicating that they behave similarly. This supports the validity of using either tool in various settings. We did not find that the CARE measure varies by patient age. Age effects are consistently reported in patient satisfaction questionnaires and correlates with the finding that younger patients rate empathy less important when consulting a physician (25). Only

one study on the JSPPPE suggested that male patients, with South American ancestry, having a regular doctor, and attending a public urban hospital were significantly associated with higher empathy scores. It was hypothesized that these groups of patients might demonstrate a considerably lower empathy expectation (41).

Multivariable models including either standardized JSPPPE or standardized CARE accounted for similarly high amounts of variation in patient satisfaction but included slightly different factors with lesser influence in the models (new patients for JSPPPE scores and single patients for CARE scores). A tertiary analysis of CARE measure items (Online Appendix 5, Table 12) showed that single patients scored significantly lower empathy on item 3 "really listening," item 6 "showing care and compassion," item 9 "helping you to take control," and item 10 "making a plan of action with you". A tertiary analysis by JSPPPE item (Online Appendix 5, Table 13) found that new patients scored lower empathy on item 2 "The doctor asks about what is happening in my daily life" and item 4 of JSPPPE score "The doctor understands my emotions, feelings, and concerns." Similar findings in another study demonstrated that patients who know their doctor longer reported higher perceived empathy, which might explain why established patients scored higher JSPPPE scores (41).

In conclusion, our data confirm that both measures of physician empathy address the same construct (patient perceived empathy) and both are unaffected by covariates. Perceived empathy accounts for a substantial amount of the

variation in patient satisfaction. We prefer the JSPPPE over CARE because it is shorter and has a lower ceiling effect. Given that the JSPPPE also has a notable ceiling effect, a new empathy measure that can better discriminate among highly perceived empathy (eg, a computer adaptive test using item response theory) might help inform efforts to improve clinician communication and the therapeutic relationship.

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Supplemental Material

Supplemental material for this article is available online.

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