# Is there a correlation between the patient-doctor relationship questionnaire and other patient-reported experience measures?

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## Abstract

Patient reported experience measures (PREMs) can quantify the quality of the patient-clinician relationship, which is associated with adherence and improved health. However, the scales used to assess PREMs have large ceiling effects, which limits our ability to learn and improve. This study assessed the correlation of four PREMs: the patient-doctor relationship questionnaire (PDRQ), a measure of perceived empathy, a measure of satisfaction with the visit, and a measure of communication effectiveness. We also assessed ceiling effects. We prospectively enrolled 103 new and return patients in this cross-sectional study. Patients completed a demographic questionnaire, the PDRQ, Jefferson Scale of Patient Perceptions on Physician Empathy (JSPPPE), four questions assessing communication effectiveness from the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS), an 11-point ordinal measure of satisfaction with the doctor, and four psychological measures. Correlations and ceiling effects were measured. In bivariate analysis, PDRQ had large correlations with measures of perceived empathy (r=0.58, P<0.001), satisfaction (r=0.59, P<0.001), and communication effectiveness (r=0.66, P<0.001). No PREMs correlated with psychological measures. Ceiling effects were common: PDRQ 55%, JSPPPE 35%, communication effectiveness 33%, and satisfaction 76%. These large correlations support prior evidence that these PREMs measure a common underlying construct, and a single questionnaire may suffice. To better understand factors associated with improved patient experience, we need measures with limited ceiling effect.

## Keywords

Patient doctor-relationship questionnaire, Jefferson scale of patient perceptions on physician empathy, patient reported experience measures

## Introduction

The quality of the relationship between clinician and patient influences adherence to treatment, outcomes, and patient satisfaction in general medicine[1-5] and in surgical care.[6-8] Furthermore, a healthy patient-clinician relationship also improves clinician resilience[9] and satisfaction at work.[10] The relationship between patient and clinician is based on trust, knowledge, regard, and loyalty.[11] There are numerous instruments designed to measure patient perceptions of the relationship with the clinician and most of these instruments measure empathic components.[12] Hojat et al.[13] defines empathy in the context of patient care as "a predominantly cognitive (rather than emotional) attribute which involves an understanding (rather than feeling) of experiences, concerns, and perspective of the patient, combined with a capacity to communicate this understanding, and an intention to help."[14] As with other patient-reported experience measures (PREMs) such as measures of

satisfaction and effective communication, measures of perceived empathy have large ceiling effects.[15] Indeed, so many people mark one of the top two scores that these ordinal instruments are routinely converted to dichotomous outcomes.[16] A measurement with strong ceiling and floor effects result in what statistician refer to as censoring: unknown values above the measurement threshold. Censoring is undesirable in both research as well as quality and process improvement because important information is lost that could help determine important associations that raise opportunities to improve the patient experience.

There are several questionnaires designed to measure patient perceptions of clinician empathy.[17] In a prior study, we determined that Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPPE) has less ceiling effect than the Consultation-and-Relational-Empathy (CARE) measure.[18]

The aim of this study was to evaluate another patient experience measure (the patient-doctor relationship questionnaire; PDRQ) for ceiling effects and correlation with other patient experience measures and psychological factors. Our primary hypothesis was that there is no correlation between the 9-item short form of PDRQ and JSPPPE. Our secondary hypotheses were that (1) there is no correlation between the PDRQ-9 and questions derived from the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAPHS) questionnaire on physician communication effectiveness, and (2) between the PDRQ-9 and patient satisfaction (measured on a 0-10 ordinal scale), (3) there is no difference in mean frequency of highest possible scores achieved (ceiling effect) of the PDRQ-9 compared to the JSPPPE, CG-CAHPS communication effectiveness and satisfaction, (4) there is no difference in internal consistency, and completion time of PDRQ-9 compared to JSPPPE. And finally, we assessed which psychological factors accounted for variation in PDRQ-9 and JSPPPE.

## Methods

### Study Design
After institutional review board approval, we prospectively enrolled 103 patients in a cross-sectional study over a 4-month period, at one of five participating orthopaedic specialist offices in a large urban area. We included all new or return patients aged 18 to 89 years old. Patients were excluded if they were not fluent in English because some questionnaires were not available in other languages. After the visit with the surgeon, a research assistant not involved in patient care explained the study to the patient and asked them to participate. Completing the questionnaires represented consent.

### Outcome Measures
Patients were asked to complete six questionnaires, (1) a demographic survey including the following variables: age, sex, reason for the visit as indicated by the patient (trauma vs. non-trauma), (2) PDRQ-9, (3) JSPPPE, (4) four questions assessing communication effectiveness from the CG-CAPHS, (5) an overall rating of the doctor on an 11-point ordinal scale (a measure from the CG-CAPHS), (6) the 4 question Pain Catastrophizing Scale (PCS-4), (7) a two question version of the Pain Self-Efficacy Questionnaire (PSEQ-2), (8) the two-question versions of the Generalized Anxiety Disorder (GAD-2), and (9) Patient Health Questionnaire (PHQ-2).

The PDRQ-9 measures the patient's perception of the relationship between the clinician and the patient. It is a 9-item questionnaire, each item is scored from 1 (not at all appropriate) to 5 (totally appropriate), the total score ranges from 9 to 45 with higher score indicating a more favorable patient perception of the patient-doctor relationship.[1]

The JSPPPE measures patient perception of clinician empathy. It is a 5-item questionnaire, each item answered on a 7-point Likert scale between Strongly Disagree (1) to Strongly Agree (7). The total score ranges from 5 to 35, with higher scores indicating greater perceived clinician's empathy.[13,15,19]

The CG-CAHPS records patients' experience with the clinicians and staff.[20-22] Five scores can be reported, four composite measures (timeliness of care, how well providers communicate with patients, providers' use of information to coordinate patient care and interaction with office staff) and one overall rating of the clinician. For the purpose of this study the overall rating of the clinician and the composite measure of communication effectiveness were used. The measure of clinician communication includes four items (provider explained things in a way that was easy to understand, provider listened carefully to patient, provider showed respect for what patient had to say, provider spent enough time with patient), which are answered on a 4-point scale (1=never, 2=sometimes, 3=usually, 4=always). This composite score can be reported by top box (the percentage of responses in the most positive response categories) or average scoring (mean across all the responses). The overall rating of the doctor uses a scale from 0 to 10, with 0 being the worst doctor possible and 10 being the best doctor possible. We inadvertently used a scale numbered from 0 to 100.

The PCS-4 consists of 4 questions measuring maladaptive thoughts in response to nociception[23] on a 4-item scale (0=not at all to 4=all the time). The scale contains two items on magnification, one item on rumination, and one item on helplessness. Higher scores indicate more worst-case thinking, a potentially unhelpful cognitive coping strategy.[24]

The PSEQ-2 measures adaptive cognitive coping strategies in response to nociception. Specifically, the understanding that one can engage in normal activities and achieves one's goals. Total scores range from 0 (not at all confident) to 12 (completely confident), with 12 representing more adaptive thoughts.[25]

The GAD-2 is a 2-item questionnaire that measures symptoms of anxiety in the last two weeks. The total score ranges from 0 (not at all) to 6 (nearly every day), with higher score indicating greater symptoms of anxiety.[26]
The PHQ-2 is a 2-item questionnaire that measures symptoms of depression. The items are scaled from 0 (not at all) to 3 (nearly every day). The total score ranges from 0 to 6 with higher scores indicating more symptoms of depression.[27]

**Table 1. Patient and clinical characteristics**

| Variables | N=102 |
|---|---|
| Age in years, median (IQR) | 55 (40-65) |
| Women, n (%) | 57 (56) |
| Diagnosis, n (%) | |
| Trauma | 35 (34) |
| Non-trauma | 67 (66) |
| PCS-4, median (IQR) | 5.0 (2.0-10) |
| PSEQ-2, median (IQR) | 8.5 (6.0-12) |
| GAD-2, median (IQR) | 1.0 (0.0-3.0) |
| PHQ-2, median (IQR) | 1.0 (0.0-2.0) |
| CG-CAHPS communication, median (IQR) | 4.0 (4.0-4.0) |
| Satisfaction, median (IQR) | 94 (83-100) |
| PDRQ, median (IQR) | 45 (37-45) |
| JSPPPE, median (IQR) | 32 (25-35) |

PCS=Pain Catastrophizing Scale; PSEQ=Pain Self-Efficacy Questionnaire; GAD=Generalized Anxiety Disorder; PHQ=Patient Health Questionnaire; CG-CAHPS=Clinical and Group Consumer Assessment of Healthcare Providers and Systems; PDRQ=Patient-Doctor Relationship Questionnaire; JSPPPE= Jefferson Scale of Patient Perceptions of Physician Empathy

### Patient Characteristics

After excluding one patient that started but did not complete the survey, 102 patients remained for final analysis. Median age of the cohort was 55 (interquartile range [IQR] 40-65) and 56% were women. Two-thirds of people had non-traumatic problems (66%) (Table 1).

### Statistical Analysis

Continuous variables were reported as median with IQR and discrete variables as proportions. In order to assess the associations between PDRQ-9 and JSPPPE with the independent variables, we used Spearman rho correlation coefficients for continuous variables and the Mann-Whitney Test for dichotomous variables. To calculate the floor and ceiling effect of the PDRQ-9 and JSPPE we assessed the frequency of the lowest and highest 5% of scores respectively, as well as the percentage of minimum and maximum scores. Differences in categorical variables were calculated using the Fisher's exact test. Because of no floor effect for the JSPPPE score, no difference was calculated. Correlation between PDRQ-9 and JSPPPE completion time was assessed with the Spearman rho correlation coefficient. To measure how closely the set of items within the PDRQ-9 and JSPPPE questionnaire are related, we calculated the internal consistency of each instrument using Cronbach $\alpha$. The higher the $\alpha$ value, the more the items share covariance and probably measure the same underlying concept. We planned to move all psychological measures to multivariable analysis and construct two multivariable linear regression models to identify variables independently associated with (1) PDRQ-9 and (2) JSPPPE. To assess the proportion of variance in the dependent variable explained by the (individual) independent variables, we planned to calculate semi partial R-squared ($R^2$) and adjusted $R^2$ values. P <0.05 was considered statistically significant.

A priori power analysis indicated that a sample of 98 subjects would provide 80% statistical power with alpha set at 0.05 to find a hypothesized correlation of 0.67 with a target correlation of 0.80. In order to account for 5% incomplete responses, we aimed to enroll 5% more.

### Results

PDRQ-9 had large correlations with JSPPPE ($r$=0.58, P<0.001; Table 2), satisfaction ($r$=0.59, P<0.001), and communication effectiveness (r=0.66, P<0.001; Table 2).

**Table 2. Bivariate analyses of factors associated with PDRQ and JSPPPE**

| | PDRQ | P value | JSPPPE | P value |
|---|---|---|---|---|
| **Age, *r*** | 0.09 | 0.360 | 0.02 | 0.812 |
| **Gender** | | | | |
|   Man | 48 | 0.271 | 49 | 0.449 |
|   Women | 54 | | 53 | |
| **Diagnosis** | | | | |
|   Trauma | 57 | 0.165 | 59 | 0.050 |
|   Non-trauma | 49 | | 47 | |
| **PCS-4, *r*** | -0.05 | 0.622 | -0.17 | 0.098 |
| **PSEQ-2, *r*** | 0.07 | 0.460 | 0.04 | 0.661 |
| **GAD-2, *r*** | 0.02 | 0.861 | 0.00 | 0.999 |
| **PHQ-2, *r*** | -0.05 | 0.605 | -0.06 | 0.525 |
| **CG-CAHPS communication, *r*** | 0.66 | **<0.001** | 0.54 | **<0.001** |
| **Satisfaction, *r*** | 0.59 | **<0.001** | 0.59 | **<0.001** |
| **JSPPPE, *r*** | 0.58 | **<0.001** | - | |

Spearman's rho correlation for continuous variables indicated by *r*. PDRQ=Patient-Doctor Relationship Questionnaire; JSPPPE=Jefferson Scale of Patient Perceptions of Physician Empathy; PCS=Pain Catastrophizing Scale; PSEQ=Pain Self-Efficacy Questionnaire; GAD=Generalized Anxiety Disorder; PHQ=Patient Health Questionnaire; CG-CAHPS=Clinical and Group Consumer Assessment of Healthcare Providers and Systems.

PDRQ-9 had more maximum scores (55% vs. 35%; P <0.001) and more scores in the top 5% (59% vs. 40%; P<0.001) than JSPPPE. Both measures took an average of 50 seconds to complete. Both PDRQ-9 and JSPPPE had substantial internal reliability: Cronbach's α of 0.97 and 0.94 respectively (Table 3). The PDRQ-9 also had more ceiling effect than satisfaction (33%; P<0.001) and less than communication effectiveness (76%).

No psychological factors were associated with PDRQ-9 or JSPPPE in bivariate analysis, so we omitted the planned multivariable analysis.

## Discussion

Most patient-reported experience measures (PREMs) have notable ceiling effects. This lost information (censoring) makes it difficult to learn about factors associated with a better patient experience so that we can improve. This study assessed the PDRQ-9 and compared it to other experience measures including the JSPPPE, the communication effectiveness questions from the CG-CAHPS questionnaires and an 11-point ordinal measure of satisfaction.

This study has some limitations. First, only English-speaking patients were included; this might limit the generalizability of the results. Second, mutual knowledge, trust, loyalty and regard, on which the relationship is based,[11] might have been affected by the inclusion of return patients. Finally, all the surgeons were men, so these results may apply best to male surgeons in an orthopaedic specialty care setting. A systematic review found no difference in empathy assessed on the CARE measure between primary care physicians, specialists and complementary and alternative medicine providers. However, women clinicians were more empathic than men and allied health professionals scored higher than physicians.[28]

The large correlation between PDRQ-9 and JSPPPE suggests that these measures may quantify a common underling construct. The two measures of perceived clinician empathy that we have evaluated are largely correlated and ask similar questions. Both the JSPPPE and the PDRQ-9 ask if the patient feels understood: "my physician understands me" (PDRQ-9), "[the physician] understands my emotions, feelings and concerns"

**Table 3. Floor and ceiling effect PDRQ vs other PREMs, completion time, and internal consistency PDRQ vs JSPPPE**

| | PDRQ | JSPPPE | PDRQ vs JSPPPE | CG-CAPHS communication | PDRQ vs CG-CAPHS communication | Satis-faction | PDRQ vs satisfaction |
|---|---|---|---|---|---|---|---|
| | | | P value | | P value | | P value |
| **Ceiling effect (top score), n (%)** | 56 (55) | 35 (35) | **<0.001** | 77 (76) | **<0.001** | 34 (33) | **<0.001** |
| **Ceiling effect (top 5%), n (%)** | 60 (59) | 41 (40) | **<0.001** | 77 (76) | **<0.001** | 50 (49) | **<0.001** |
| **Floor effect (lowest score) , n (%)** | 1 (1.0) | 0 (0.0) | - | - | - | - | - |
| **Floor effect (lowest 5%), n (%)** | 2 (2.0) | 0 (0.0) | - | - | - | - | - |
| **Completion time PDRQ vs JSPPPE (seconds), median (IQR)** | 50 (39-73) | 48 (33-65) | 0.136 | - | - | - | - |
| **Cronbach alpha** | 0.97 | 0.94 | - | - | - | - | - |

PDRQ=Patient-Doctor Relationship Questionnaire; JSPPPE=Jefferson Scale of Patient Perceptions of Physician Empathy; CG-CAHPS=Clinical and Group Consumer Assessment of Healthcare Providers and Systems

(JSPPPE), as well as "[the physician] is an understanding doctor" (JSPPPE). The JSPPPE is favored for it's more limited ceiling effects, but a measure with even less ceiling effect is necessary for us learn from the large group of patients that rate us highly, but likely see opportunities for improvement.

The large correlation between PDRQ-9 and other PREMs (satisfaction and communication effectiveness) suggests that all three types of PREMs quantify a common underlying construct. The domains of both PREMs are contained in the PDRQ-9, namely the notion of time spent with the clinician "my physician has enough time for me" (PDRQ-9) and "provider spent enough time with patient" (CH-CAHPS), communication, understanding, and satisfaction. This may explain the consistent observation of large correlations between perceived empathy, clinician-patient relationship with communication effectiveness and satisfaction.[5-7,29]

Both the PDRQ-9 and the JSPPPE have unacceptably high ceiling effects. The internal consistency of the PDRQ-9 and the notable ceiling effect we observed are similar to what was reported in previous research in Dutch,[1] German,[29] and Spanish[30] populations. The PRDQ-9 was initially developed in the Dutch primary care setting and showed good psychometrics characteristics including factorial structure, reliability and validity.[1]

We observed no association between psychological measures and the PDRQ-9 and JSPPPE, which is inconsistent with prior research. In a cross-sectional study including 703 adults with coronary artery disease, Schenker et al.[16] reported a large association between clinician-patient communication effectiveness as assessed by the patient and symptoms of depression measured on the PHQ-9 after adjustment for medical comorbidities, disease severity and patient demographics (odds ratio 1.5; 95% CI 1.2 to 1.8). Swenson et al.,[31] including 231 patients with diabetes mellitus type II, severe depression symptoms were independently associated with suboptimal communication in the multivariable model. However, in both studies communication was coded as a dichotomous outcome, which can lead to statistical limitations.[32] Further research assessing the patient-clinician relationship is needed to assess the influence of the mental health. Besides psychological measures, social factors should also be considered. Qualitative research reported that patients from lower socio-economic status (SES) perceived that their SES affected their health care experiences.[33] In a secondary analysis of 112 videotaped consultations by eight general practitioners, CARE was used to measure perceived empathy, and the Measure of Patient-Centered Communication was used by two researchers to rate communication effectiveness based on transcripts. Among patients with lower SES status, greater empathy was related to understanding the whole person, in higher SES areas empathy was related to response to emotional

queues, and in both groups empathy was associated with establishing common ground.[34]

Various PREMs ask similar questions and have large correlations suggesting they all measure the same underlying construct and have unacceptably high ceiling effects. This underlying construct or connectedness could be described as the measurement of the components of the relationship (knowledge, trust, loyalty, and regard) and their interaction within the patient-clinician interaction, which is being developed any time when patient and clinician interact. Research is merited to determine whether a single, perhaps very brief measure of patient experience developed to limit ceiling effects can inform efforts to understand the factors associated with perceived empathy, communication effectiveness, and satisfaction with care so that we can develop care strategies that improve the patient experience.

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