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Abstract

The purpose of this investigation was to determine the effect of physician patient-centeredness on patient trust across randomly selected groups of patients from an inner city medical practice serving a preponderance of minority and socioeconomically-disadvantaged patients.

METHODS: A two-factor multigroup structural equation modeling design was employed, with randomly selected test (N = 300) and cross-validation (N = 300) samples of medical practice patients. Equality constraints were established to test the invariance of effects across groups. The model was compared to its unconstrained counterpart to further test its trustworthiness. An additional 5,000 nonparametric bootstrapped samples for each group were generated to further cross-validate and assess the stability of effect estimates.

RESULTS: The model fit well. Physician patient-centeredness significantly influenced patient trust, explaining 82 percent of its variability. When physician patient-centeredness increased by one unit, the predicted value for patient trust increased by 1.043 units (.903 standardized). Patient-centered physician behaviors increased patients' confidence in and likelihood to recommend their physician. This pattern of effects held across the test and cross-validation groups. The hypothesized model was sustained when compared to its competing counterpart.

CONCLUSIONS: Evidence supported the factor and structural validity of the model. This study offers a plausible two-factor model for the measurement and improvement of patient-centeredness, and concomitantly, patient trust in an inner city medical clinic serving minority and socioeconomically-disadvantaged patients. In addition to quality improvement and outcome measurement, the results have implications for improving patient-centeredness, patient trust, the patient-provider relationship, medical education, and reducing health care disparities.

Keywords

Communication in medicine; Decision making; Minorities; Patient participation; Patient satisfaction; Patient trust; Patient-centered health care; Patient-centeredness; Physician and patient; Poor; Primary Provider Theory; Structural equation modeling; Trust

Cover Page Footnote

This research was partially supported by a National Research Service Award postdoctoral fellowship from the Agency for Health Care Research and Quality sponsored by the Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Grant T32 HS00032 and Winston-Salem State University's School of Health Sciences.

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Abstract

The purpose of this investigation was to determine the effect of physician patient-centeredness on patient trust across randomly selected groups of patients from an inner city medical practice serving a preponderance of minority and socioeconomically-disadvantaged patients. **METHODS:** A two-factor multigroup structural equation modeling design was employed, with randomly selected test ($N = 300$) and cross-validation ($N = 300$) samples of medical practice patients. Equality constraints were established to test the invariance of effects across groups. The model was compared to its unconstrained counterpart to further test its trustworthiness. An additional 5,000 nonparametric bootstrapped samples for each group were generated to further cross-validate and assess the stability of effect estimates. **RESULTS:** The model fit well. Physician patient-centeredness significantly influenced patient trust, explaining 82 percent of its variability. When physician patient-centeredness increased by one unit, the predicted value for patient trust increased by 1.043 units (.903 standardized). Patient-centered physician behaviors increased patients' confidence in and likelihood to recommend their physician. This pattern of effects held across the test and cross-validation groups. The hypothesized model was sustained when compared to its competing counterpart. **CONCLUSIONS:** Evidence supported the factor and structural validity of the model. This study offers a plausible two-factor model for the measurement and improvement of patient-centeredness, and concomitantly, patient trust in an inner city medical clinic serving minority and socioeconomically-disadvantaged patients. In addition to quality improvement and outcome measurement, the results have implications for improving patient-centeredness, patient trust, the patient-provider relationship, medical education, and reducing health care disparities.

Key Words: patient satisfaction, patient-centeredness, patient trust, Primary Provider Theory, structural equation modeling

Preamble

For years, the research has shown that health disparities exist. Yet the most recent National Healthcare Disparities Report reaffirms that “disparities related to race, ethnicity, and socioeconomic status still pervade the American health care system.” Clearly, demonstration of disparities’ existence is insufficient to overcome them. Disparities questions should be addressed by theory, methodological rigor, and evidence, but perhaps more importantly, they must now be informed by patients who have actually experienced disparities. To this end, the authors hope to illuminate what minority and socioeconomically-disadvantaged medical practice patients are saying about the patient-centeredness of their physicians and how it ultimately influences their trust.

Guided by the Primary Provider Theory, which was recently presented as a model for measuring minority patient-centered care, satisfaction and trust at the Office of Minority Health’s National Summit on Eliminating Racial and Ethnic Disparities, this evidence-based investigation was conducted at a historically black college and university school of health sciences, by authors who have actually experienced disparities and served minority and socioeconomically-disadvantaged patients.

Introduction

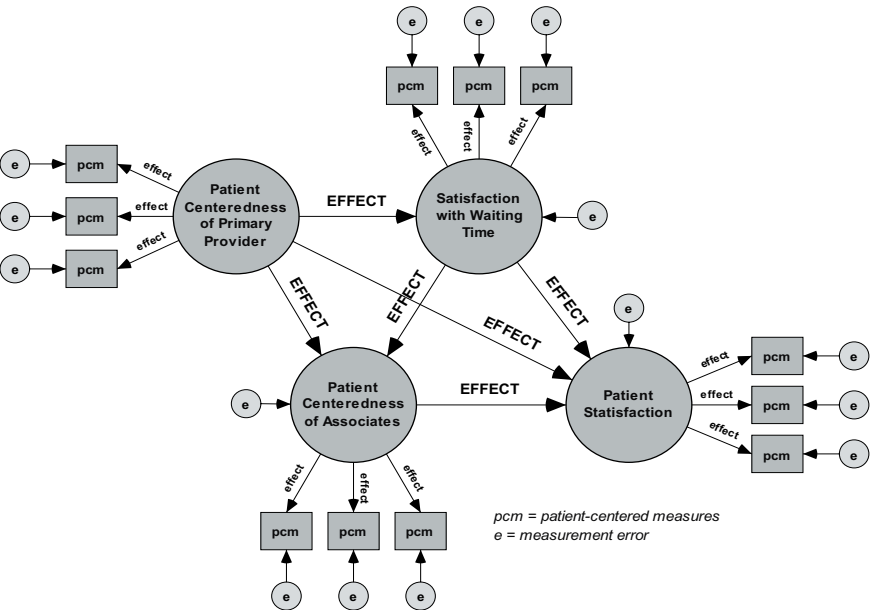
A latent ability of the best physicians, allied health care and other providers, patient-centeredness received national attention as a precursor of successful patient-provider relationships in 2001 with the Institute of Medicine’s publication of *Crossing the Quality Chasm: A New Health System for the 21st Century*. This report reaffirmed patient-centeredness as an important component of medical quality and recommended that health practitioners be more focused on patients’ preferences, needs, and values.¹ Tacitly agreeing, the Agency for Healthcare Research and Quality added patient-centeredness to both the National Healthcare Quality Report and the National Healthcare Disparities Reports as a core measure of medical quality.^{2,3,4} Despite these affirmations, patient-centered care has not been realized by minority and socioeconomically-disadvantaged patients who suffer health care disparities. As with patient-centeredness, patient trust also has become part of the national debate as an important component in the underlying complex of medical quality and outcomes.⁵⁻⁸ Correspondingly, patient trust has been posited as an endogenous latent construct and function of the patient-centeredness of

the provider.⁹⁻¹⁴ This is an important proposition. Human nature tells us that improving patients' trust in physicians is not only important, but also good. As health care becomes increasingly expensive and contentious, the importance of physician patient-centeredness and patient trust will increase. However, to increase patient-centeredness and trust, physicians must first have an evidence-based understanding of their interaction. This is the subject matter of this investigation.

Underlying Theory

The theoretical framework for this investigation is the Primary Provider Theory (Figure 1), which maintains that outcomes like patient satisfaction and trust are rooted in the relationship between the patient and their primary provider. The theory holds that patient satisfaction is the function of an underlying network of factors, including the patient-centeredness of the primary provider, care associates, and waiting time. In the underlying network, these factors are hierarchically related to patient utility, where the primary provider has the greatest clinical importance and value to patients, and as a result, influence on outcomes like patient satisfaction and trust. The theory underscores the importance of the patient-provider relationship and recognizes clinical preeminence of the primary provider. It is operationalized by patient-centered measures exclusively, where only patients judge the quality

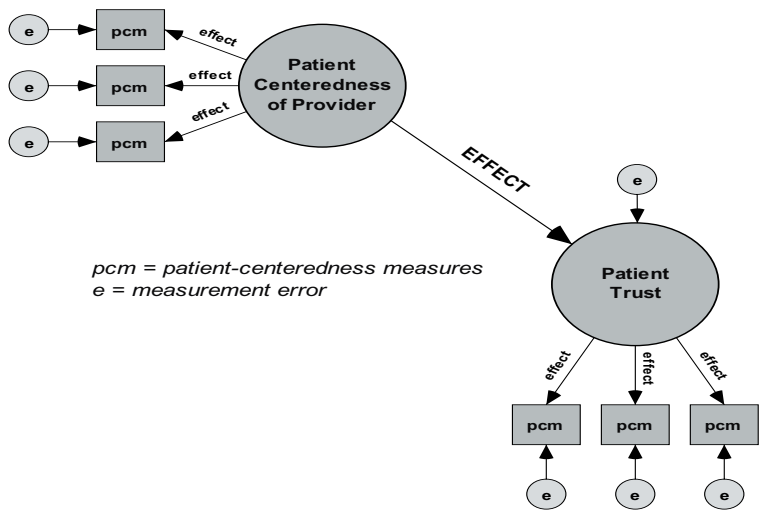
Figure 1. The Primary Provider Theory



of service. All other judgments are immaterial. As a measurement paradigm, the theory is generalizable and can accommodate a range of care outcomes and health care providers, including physicians, allied health practitioners, hospital nurses, nurse practitioners, dentists, physician assistants and others in their respective clinical settings.^{15, 16, 17}

Extending the theory’s sub-proposition that the primary provider directly influences the outcome of patient satisfaction, this investigation examines patient-centeredness’ effect on patient trust. This is a testable proposition and the results can inform health care policy, patient-centeredness, patient-centered care, and patient trust. The purpose of this investigation, as reflected in Figure 2, was first to determine the effect of physician patient-centeredness on patient trust in an inner city medical clinic serving a preponderance of minority and socioeconomically-disadvantaged patients, and secondly, to test the robustness of the effect across a randomly selected test and cross-validation groups of patients.

Figure 2. Hypothesized Model



Methods

Design

A two-factor multigroup structural equation modeling design was employed, with randomly selected test (300) and cross-validation (300) samples or groups of medical practice patients (N = 600). Equality constraints were imposed to test the invariance of effect estimates across

groups, and the model was compared to its unconstrained counterpart to further test its trustworthiness. Also, an additional 5,000 nonparametric bootstrapped samples were generated for each group to further cross-validate and assess the stability of effect estimates.

Notes on Structural Equation Modeling (SEM)

SEM is particularly appropriate for this investigation. It facilitates the simultaneous estimation of population values, from sample observations, of hypothesized relationships among observed variables and latent constructs in complex models, as is the case in this study where patient ratings of physician behaviors are observed variables, and patient-centeredness and trust are latent constructs operationalized by the observed variables. Secondly, SEM handles simultaneous multiple group analysis very well, and especially, the assessment of measurement invariance across groups. It does so by permitting the testing of increasingly restrictive hypotheses, with parameters fixed to equality across the groups of interest. Thirdly, SEM provides an alternative for handling measurement error by isolating reliable true variance from unreliable error variance, the latter being a threat to validity. By explicitly estimating and isolating the measurement error, SEM reveals the uncontaminated common (true score) variance and disattenuated effects among constructs. Fourth, SEM is disconfirmable. That is, it empirically either disconfirms or fails to disconfirm hypothesized model and directed relationships (directed paths), e.g., the effects of patient-centeredness on patient trust. Lastly, SEM is particularly suited to evidence-based investigations like the present one. Judgments about the trustworthiness of results require the convergence of key evidence, including the results of covariance structure statistical fit measures, global and local hypothesis tests, the direction and strength of effect estimates, competing model comparisons, parameter confidence intervals, replication and cross-validation results, and residual matrix output to mention several. This kind of evidence either disconfirms or fails to disconfirm the fit of the hypothesized model.^{18–22}

Model Specification and Estimation

The model was specified according to the proposition of interest (Figure 2). Accordingly, 30 parameters (measurement weights, structural weights, structural covariances, structural residuals, and measurement residuals) were set to equality in the test and cross-validation samples. The model was appropriately over identified for estimation with 56 sample moments, 30 parameters to be estimated, and 26 degrees of freedom. Mardia's measure of multivariate kurtosis exceeded 100 (p

< .05) for both samples. In light of the multivariate kurtotic character of the data, asymptotic distribution free estimation was employed, and 5,000 bootstrapped samples of each group were generated for the nonparametric estimation of effects, standard errors and confidence intervals. AMOS 6.0 (Analysis of Moment Structures) was used for model specification and estimation.

Model Evaluation

The model was judged on the basis of the convergence of evidence from: (1) generally accepted covariance structure fit measures, including the chi-square test (χ^2), root mean squared error of approximation test (RMSEA), confirmatory fit index (CFI), standardized root mean residual (SRMR); (2) the appropriateness of the direction and strength of the model's effect estimates; (3) the hypothesized constrained model's ability to sustain a competing model challenge, as determined by the chi-square difference test ($\chi^2\Delta$); (4) the compatibility of effect estimates with confidence intervals generated from 5,000 bootstrap samples; and (5) the model's ability to explain patient-centeredness, patient trust, and their relationship. The power to reject a false model in this investigation was ≈ 1.00 , assuming that an incorrect model equated to a RMSEA ≥ 10 .

Instrument and Measures

All data and observed measures were collected using the nationally used Press Ganey Medical Practice Survey. Patients rated their physicians' patient-centeredness using a 5-point scale, ranging from very poor (1) to very good (5), to measure the adequacy of explanations about patients' problems or conditions, concern for patients' questions or worries, efforts to include patients in treatment decisions, information the physician gave about medications, and instructions for follow-up care. Using the same scale, patient trust was measured on the basis of patients' confidence in and likelihood to recommend their physicians to others. Questionnaires were mailed with a postage-paid return envelope to random patients, with a signed cover letter assuring confidentiality. Completed surveys were sent to Press Ganey for coding and analysis. The latent constructs Patient-Centeredness of Primary Provider and Patient Trust were operationalized as reflected in Table 1.

Samples

As a proxy of the population of interest, a parent sample of 4,319 patients was randomly selected from the subject medical practice's patients, from the period beginning July 2001 and ending June 2004. Two separate random samples, test and cross-validation, of $N = 300$

Table 1. Measures*

LABEL	MEASURE
Patient-Centeredness of Primary Provider	
CP2	Explanations the care provider gave you about your problem or condition
CP3	Concern the care provider showed for your questions or worries
CP4	Care provider’s efforts to include you in decisions about your treatment
CP5	Information the care provider gave you about medications
CP6	Instructions the care provider gave you about follow-up care
Patient Trust	
CP9	Your confidence in this care provider
CP10	Likelihood of your recommending this care provider to others

* actual survey item wording

each were then randomly selected from the parent sample for analysis. As reflected in Table 2, the medical practice served a preponderance of minority (81 percent) patients. Seventy-seven percent were Medicaid.

Table 2: Clinic Patient Profile, 2004

	Black	White	Hispanic	American Indian	Asian	Other	Unknown
Clinic Visits	28,705	11,688	19,680	41	145	406	60
Percent	47.27	19.25	32.41	0.07	0.24	0.67	0.10

Results

The model fit the data well, with effects constrained to equality across both test and cross-validation groups, providing evidence in support of the factor validity of patient-centeredness and patient trust and the causal validity of the hypothesized two-factor structure: $\chi^2 = 48.92$, $df = 41$, $p = .185$; RMSEA = .018, $p = 1.00$, CFI = .942, SRMR = .0301. The direction and strength of effect estimates were consistent with the original theoretical framework, nested sub-proposition, and bootstrapped confidence intervals (Table 3). When compared to the unconstrained competing model, the hypothesized model with effects constrained to equality was sustained, $\chi^2\Delta = 14.875$, $df = 15$, $p = .46$. Physician patient-centeredness significantly increased patient trust and its measures, accounting for 82% of its variability ($p < .001$). One

standardized unit improvement in patient-centeredness increased the values of patient trust, confidence in and likelihood to recommend the physician by .903, .865, and .845 units, respectively (Table 4).

Table 3: Standardized Regression Effects and Bootstrapped Confidence Intervals*

Parameter		Estimate	Lower	Upper	P*
Patient Trust	← Patient-Centeredness of Provider	.903	.871	.940	.000
CP2	← Patient-Centeredness of Provider	.924	.904	.960	.000
CP3	← Patient-Centeredness of Provider	.939	.926	.972	.000
CP4	← Patient-Centeredness of Provider	.940	.930	.975	.000
CP5	← Patient-Centeredness of Provider	.918	.906	.954	.000
CP6	← Patient-Centeredness of Provider	.920	.907	.961	.000
Likelihood to Recommend	← Patient Trust	.936	.917	.969	.000
Confidence in Physician	← Patient Trust	.958	.942	.985	.000

* 90% confidence level based on N = 5,000 bootstrap samples; P < .001.

Table 4: Standardized Total Effects and Confidence Intervals*

	Patient Centeredness of Primary Provider	Lower	Upper	P*
Patient Trust	.903	.871	.940	.000
Confidence in Physician	.865	.835	.912	.000
Likelihood to Recommend	.845	.815	.895	.000

* 90% confidence level based on N = 5,000 bootstrap samples; P < .001.

Physicians’ explanations of their patients’ problems, concern for patients’ questions and worries, efforts to include patients in decision-making, information about medications, and follow-up care instructions all significantly increased patients’ ratings of their physicians’ patient-centeredness ($p < .001$). This pattern of effects held across both the test and cross-validation samples.

Table 5: Effects of Behaviors on Patient-Centeredness of Provider*

	Instructions about follow-up care	Information about medications	Efforts to include patient in decisions	Concern for patient's questions or worries	Explanations of patient's problem or condition
Patient-Centeredness of Primary Provider	.154	.147	.202	.205	.161

* P < .001; when the behavior variables increase by one unit, the predicted value for patient-centeredness of the primary provider increases as indicated in the table.

The evidence, including the factor validity of both patient-centeredness and patient trust, the model’s fit, the robustness of effects across groups, the competing model challenge, the magnitude and significance of effects, the convergence of the model’s effects on the bootstrap confidence intervals, and the resulting squared multiple correlations all converged in support of the model’s factor and causal structure and inferences (Figures 3 and 4).²³

Figure 3. Unstandardized Results

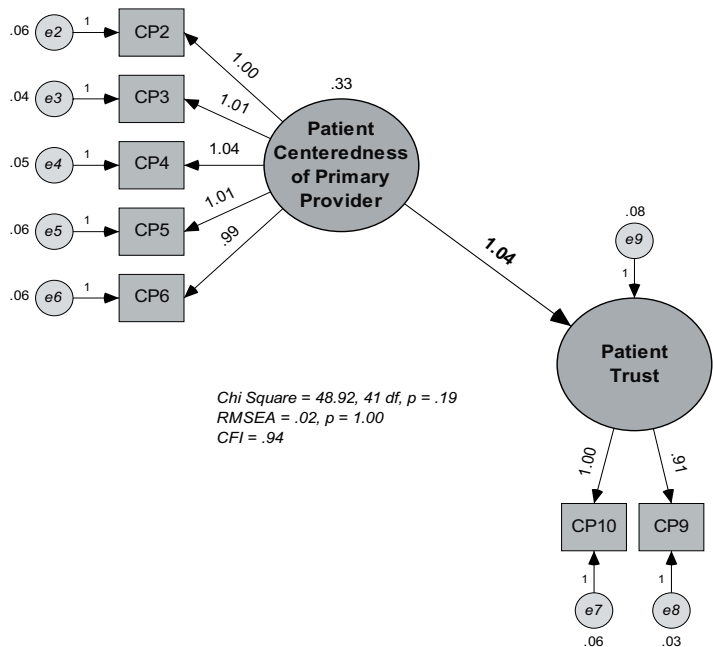
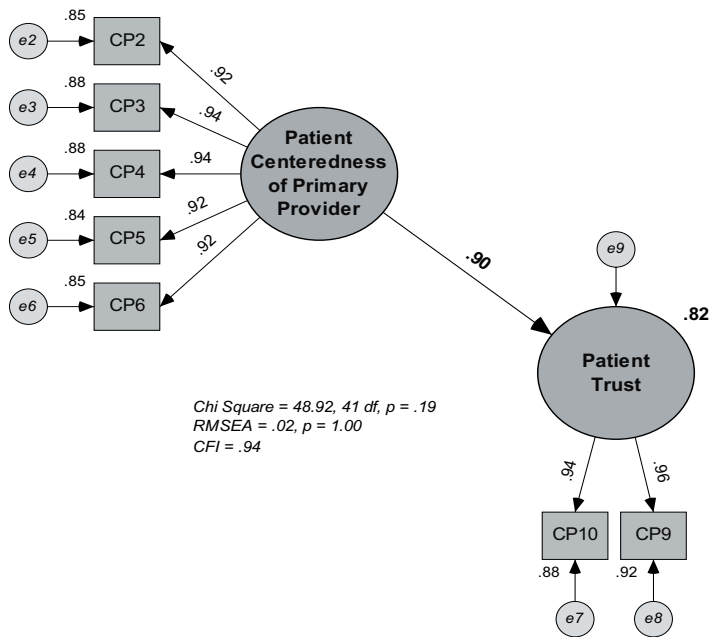


Figure 4. Standardized Results



Conclusion

The convergence and weight of evidence supported the factor and structural validity of the model. Physician patient-centeredness significantly influenced patient trust, explaining most of its variability. Correspondingly, physician behaviors including explanations of patients’ problems or conditions, concern for their questions and worries, efforts to include them in decisions, providing information about medications, and instructions about follow-up care all increased patients’ perceptions and ratings of their physicians’ patient-centeredness. This study offers a plausible two-factor model for the measurement and improvement of patient-centeredness and patient trust in an inner city medical clinic serving minority and socioeconomically-disadvantaged patients. In addition to quality improvement and outcome measurement, the results have implications for improving patient-centeredness, patient trust, the patient–provider relationship, medical education, and reducing health care disparities.

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