Physician-Patient Relationship and Medication Compliance: A Primary Care Investigation

Ngaire Kerse, PhD, MBChB[1]

Stephen Buetow, PhD[1]

Arch G. Mainous III, PhD[2]

Gregory Young[1]

Gregor Coster, MSc, MBChB[1]

Bruce Arroll, PhD, MBChB[1]

[1]Department of General Practice and Primary Health Care, University of Auckland, New Zealand

[2]Department of Family Medicine, Medical University of South Carolina, Charleston, SC

ABSTRACT

PURPOSE We assessed the relationship between 4 attributes of the physician-patient relationship and medication compliance.

METHODS We conducted a waiting room survey of patients consulting 22 general practitioners in 14 randomly selected practices in Auckland, New Zealand (81% response rate). A total of 370 consecutive patients (75% response rate) completed survey instruments about 4 attributes of the physician-patient relationship. Continuity of care (assessed from use of a usual physician, length of continuity, and perceived importance of continuity) and trust in the physician were ascertained before the consultation. After the consultation the Patient Enablement Index measured the physician's ability to enable patients in self-care, and concordance between the patient and physician was measured by a 6-item inventory of perceived agreement about the presenting problem and management, were ascertained immediately after the consultation. Compliance with prescribed medication therapy was ascertained by telephone follow-up 4 days after the consultation.

RESULTS Overall, 220 patients (61%) received a prescription, and 79% of these patients were taking the medication at follow-up. In a univariate analysis adjusted for clustering, only trust and physician-patient concordance were significantly related to compliance. In analysis further adjusted for health and demographic factors, physician-patient concordance was independently related to compliance (odds ratio = 1.34, 95% confidence interval, 1.04-1.72).

CONCLUSIONS Primary care consultations with higher levels of patient-reported physician-patient concordance were associated with one-third greater medication compliance. An emphasis on understanding and facilitating agreement between physician and patient may benefit outcomes in primary care.

Conflicts of interest: none reported

CORRESPONDING AUTHOR

Ngaire Kerse, PhD, MBChB
Department of General Practice
and Primary Health Care
Faculty of Medical and Health Sciences
University of Auckland
Private Bag 92019
Auckland, New Zealand
n.kerse@auckland.ac.nz

INTRODUCTION

The physician-patient relationship is integral to the successful delivery of primary health care.[1] The quintessential character of the physician-patient relationship, however, has been difficult to define, especially in the face of mounting societal pressures for fiscal constraint and population-based health care.[2]

In any consultation several attributes of the physician-patient relationship may affect the outcome, including a longitudinal relationship between patient and physician (continuity of care)[3]; concordance, or agreement, between the patient and physician on the problem or need and its management[4]; patients' trust in their physician to act in their best interest; and the ability of the physician to enable the patient toward effective self-care (patient enablement).[5] Which of these aspects is most closely associated with outcomes of primary health care has not been established.

Continuity of care between patients and physicians has been associ-

ated with improved health services use and preventive care,[3,6] the physician's understanding of the psychosocial aspects of patient care,[7] and satisfaction with care.[8] As continuity appears to be a general construct under which a variety of concepts fit,[9] several tools have been developed to measure different aspects of continuity. Which particular aspect confers most benefit is unknown.

The level of agreement or concordance between physician and patient about the nature of the patient's problem is associated with resolution of nonspecific signs and symptoms.[10] Less rigorous methods show an association between concordance and patient adherence to management and medication plans.[4,11,12] Patients are less likely to return for visits when there is a lack of physician-patient concordance,[13] although the relationship is inconsistent.[14,15] Trust is said to be essential to the medical consultation and is related to continuity and patient satisfaction.[16,17] The ability of the physician to enable the patient toward effective self-care is a marker of consultation quality.[5]

Medication prescribing is a core component of medical care, and patient compliance with recommendations to take medications varies.[18] In this study, we sought to establish potential associations between attributes of the physician-patient relationship and medication compliance. We report an investigation measuring self-reported continuity and trust before the consultation, and physician-patient concordance and enablement immediately after the consultation, and we then relate these attributes to subsequent medication compliance.

METHODS

Design
We asked general practitioners, randomly selected from the Auckland metropolitan area of New Zealand, for permission to approach consecutive patients or those responsible for the patients in their practice waiting room. Patients and caretakers who were bringing a child or adult under their care were approached in the waiting room and then invited to give written informed consent to participate. Respondents completed survey instruments before and immediately after their consultation. They were telephoned 4 days later to establish compliance with medication therapy. We made 4 attempts at telephone contact at differing times of the day for a 2-day period. The Auckland Ethics Committee approved the study.

Survey Instrument
The survey instrument we used has been used in an international study of continuity and trust[16,17] and was adapted for a New Zealand audience. The instrument asked about standard demographic and health information, and contained several validated tools and a physician-patient concordance measure.

Measures: Survey Part 1
Part 1 of the survey was completed before the consultation and included the following components.

Health and Demographic Information
For ethnicity, we used patients' self-described ethnicity in response to the 1996 New Zealand census question. Education was based on high-school completion, and perceived economic status was measured with the following question: "Thinking of your money situation, would you say that your household (choose one): can't make ends meet; has just enough to get along on; is comfortable." In addition, we used eligibility for the community services (low-income assistance) card, as a marker of socioeconomic status. Health status was estimated from the presence of a chronic illness and from scores on the EuroQol 5-dimensional questionnaire (EuroQol-5D),[19] a 5-item health-related quality-of-life measure.

Source of Care
We ascertained source of care by asking, "Is there one particular surgery that you/the patient usually go to if you are sick or need advice about your health? (For example, a general practice.)" and "If yes, is there a particular doctor you/the patient usually see at this surgery?" This approach has been validated with the Usual Provider Continuity Index[20] and shows patients' ability to identify with a single source of care.

Continuity of Care
We assessed continuity of care with 3 measures. Length of continuity was established by asking, "How long have you/the patient been seeing this doctor?" This approach has been validated with other continuity measures.[21] The importance of continuity was assessed by asking, "How important is it to you to see the same GP every time you have a health problem?" with responses recorded on a Likert scale ranging from 1 (not important at all) to 5 (very important).[22] Finally, we calculated the Usual Provider Continuity Index[23]—the proportion of consultations with the usual physician— one of the most widely used measures of continuity.[9]

Trust in the Physician
We measured trust with the Trust in Physician Scale,[24] which yields a score ranging from 11 to 55, with higher scores indicating more trust. Because we measured trust before the consultation, and this measure was intended to assess established trust (and the capacity to develop

it), only patients who reported having a usual general practitioner answered this section.

Measures: Survey Part 2
Part 2 of the survey was completed immediately after the consultation and included the following components.

Physician-Patient Concordance
We assessed agreement between physician and patient with the following questions:

1. "To what extent do you think the doctor understands why you came in today?"
2. "How well do you think the doctor understood you today?"
3. "To what extent did you and the doctor agree about the main problem or need today?"
4. "To what extent did you and the doctor agree about what to do about the problem or need?"
5. "To what extent do you and the doctor agree on what part you play in making decisions about health?"
6. "To what extent do you and the doctor agree on who is responsible for different aspects of care?"

The response to each question was recorded on a Likert scale ranging from 1 (completely) to 4 (not at all). We dichotomized the results to 1 (completely) and 0 (all other responses). Results for the 6 questions were then summed to give a cumulative score between 0 and 6, with higher scores indicating greater concordance. We calculated the Cronbach α for internal consistence of the scale and report the distribution of scores.
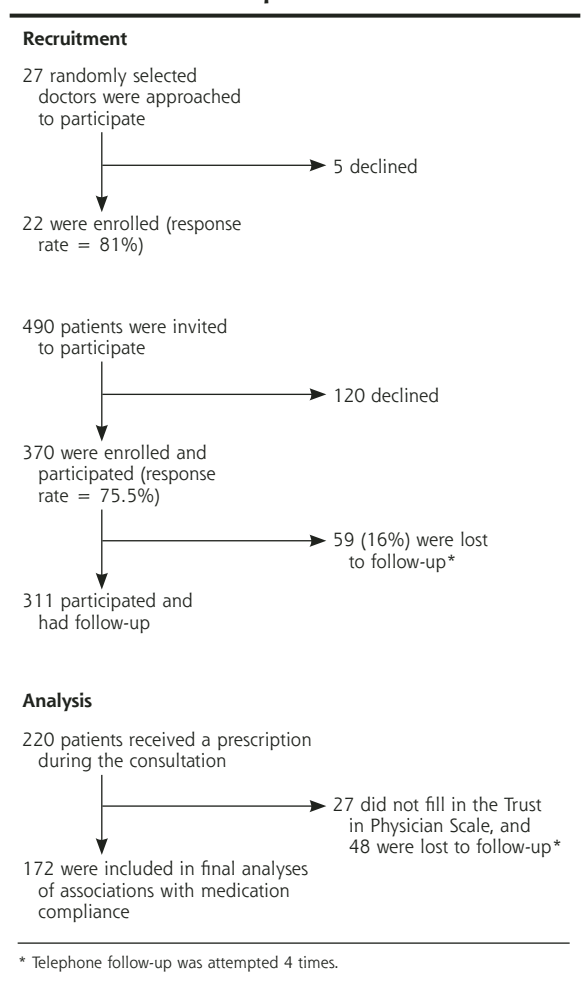
Patient Enablement
We used the Enablement Index[5] to assess whether the physician enabled the patient toward effective self-care. This index, validated in primary care against patient satisfaction, asks whether patients are more or less able to cope with life, understand and cope with their illness, and help themselves as a result of the consultation with the physician. The responses are scored from 1 to 4, with higher scores meaning more enablement.

Measures: Medication Compliance
To assess medication compliance, we first asked the patients whether they received a prescription on the day of the consultation. Four days later, we telephoned patients and asked whether they had filled the prescription, were taking the medication, and if not, why not. Patients were classified as compliant if they had received a prescription and were taking the medication at the 4-day follow-up or if they were not taking it at follow-up because it had been a repeated prescription and they already had enough medication. If they were not taking

Figure 1. Flow of primary care patients in a study about medication compliance.

Recruitment

27 randomly selected doctors were approached to participate

→ 5 declined

22 were enrolled (response rate = 81%)

490 patients were invited to participate

→ 120 declined

370 were enrolled and participated (response rate = 75.5%)

→ 59 (16%) were lost to follow-up*

311 participated and had follow-up

Analysis

220 patients received a prescription during the consultation

→ 27 did not fill in the Trust in Physician Scale, and 48 were lost to follow-up*

172 were included in final analyses of associations with medication compliance

* Telephone follow-up was attempted 4 times.

the prescribed medication at follow-up for any other reason, they were classified as noncompliant. Those who had not received a prescription during the consultation were not included in the compliance analysis.

Analyses
We produced statistics describing the sample and summary responses to the survey with SPSS v11 (SPSS Inc, Chicago, Ill). Intraclass correlations were computed for compliance within practices from a 1-way analysis of variance using Stata 7.0 (Stata Corp, College Station, Tex).

To examine relationships between consultation characteristics and the dichotomous outcome of compliance, we performed logistic regression analysis. As observations on patients were not independent within groups (practices) but were independent across groups, we adjusted for clustering with Stata 7.0. Multivariable analyses included health status, age, ethnicity, and education as control variables, and the results are reported as odds ratios. We also assessed for interaction effects

Table 1. Demographic Characteristics of a Sample of Primary Care Patients Gathered in Waiting Rooms (N = 370)

Characteristic	Mean (SD)
Age of patients, years	41.3 (15.8)
No. of consultations in last year	5.3 (6.7)
EuroQol-5D score	8.0 (2.5)
	No. (%)
Sex, female	247 (68.1)
Ethnicity	
White	276 (74.5)
Maori	46 (12.4)
Pacific Islander	32 (8.6)
Other	16 (4.3)
Economic status	
Community services card	122 (34.2)
Can't make ends meet	26 (7.0)
Have just enough	144 (38.9)
Am comfortable	189 (51.1)
Education	
Less than high school	77 (22.8)
Completed high school	144 (42.7)
Some higher qualification	116 (34.4)
Person consulting	
Myself	276 (76.2)
A child I am caring for	81 (22.4)
An adult I am caring for	5 (1.4)
Chronic illness in the patient	113 (30.9)

Note: Because of rounding, percentages may not all total 100.

EuroQol-5D = the EuroQol 5-dimensional questionnaire.

Table 2. Consultation Characteristics of a Sample of Primary Care Patients Gathered in Waiting Rooms (N = 370)

Characteristic	Value
Trust	
Trust in Physician Scale score, mean (SD)	44.57 (6.25)
Source of care	
Has a usual source of care (clinic), No. (%) of patients	326 (88.1)
Has a usual doctor, No. (%) of patients	279 (75.4)
Continuity of care	
UPC Index score, mean (SD)	0.75 (0.31)
Length of care with same doctor, No. (%) of patients	
< 1 year	82 (24)
1-2 years	56 (16)
3-5 years	69 (20)
6-10 years	49 (14)
> 10 years	91 (26)
Importance of seeing same doctor at each visit, No. (%) of patients	
Very important	152 (41.3)
Quite important	150 (40.9)
Neutral	40 (10.9)
Not very, not important at all	26 (8.2)
Enablement	
Enablement Index score, mean (SD)	2.1 (0.75)
Doctor-patient concordance	
No. (%) of patients responding "completely"*	
To what extent do you think the doctor understands why you came in today?	294 (89.1)
How well do you think the doctor understood you today?	293 (88.5)
To what extent did you and the doctor agree about the main problem or need today?	280 (84.5)
To what extent did you and the doctor agree about what to do about the problem or need?	278 (84.2)
To what extent do you and the doctor agree on what part you play in making decisions about health?	241 (73.9)
To what extent do you and the doctor agree on who is responsible for different aspects of care?	239 (74.7)
Overall score, mean (SD)	3.6 (1.9)
Compliance	
No. (%) of patients responding "yes"	
Received prescription during consultation	220 (61.3)
Picked up prescription from pharmacy†	150 (86.7)
Taking medication†	136 (78.6)‡

Note: Because of rounding, percentages may not all total 100.

UPC = Usual Provider Continuity.

* Responses were missing for 35 patients.
† Values are based on 172 patients who received a prescription and had follow-up.
‡ An additional 8 patients received a repeated prescription and already had enough medication.

on medication compliance. Values were coded as missing if follow-up with the respondent had not been possible. We omitted from the logistic regression model cases that were missing values for any of the variables.

RESULTS

Twenty-two physicians of 27 approached in 14 surgeries were enrolled in the study. Of 490 consecutive patients, 370 were enrolled (75.5%). The number of patients attending on the recruitment days ranged from 5 to 40. On average, 16 patients were enrolled from each physician (range, 2-34 patients per physician; SD, 9.5). Figure 1 shows the disposition of patients and the number included in the multivariable analysis. The 59 patients who could not be followed up by telephone were indistinguishable from those that were by age (41.4 vs 42.1 years, $P = .79$), sex (62% vs 70% female, $P = .25$), and presence of a chronic disease (33% vs 38%, $P = .52$).

Table 1 shows the demographic and health status of the sample. Three quarters of the patient sample consulted the physician for themselves. The remainder were bringing a child or adult under their care. About one third of respondents (30.9%) had a major illness, and the average number of consultations in the previous year was 5.3 (SD, 6.7 consultations).

Table 2 shows that most participants had a regular source of care and that most patients perceived continuity of care to be quite or very important. Reported concordance between physician and patient was high when considering individual agreement items. The 6-item scale was internally consistent ($\alpha = 0.87$), and scores ranged from low (1-3) to medium (3-4) to high (5), with 23%, 20%, and 57% of respondents in each range, respectively.

Most respondents (61.3%) received a prescription for medication, and 78.6% of those who could be reached by telephone took this medication. Compliance with medications within practices yielded an intraclass correlation of .07 (SE, .06). The 150 patients not receiving a prescription were indistinguishable from those receiving a prescription in age ($t = 0.94$, $P = .34$) and sex ($\chi^2 = 1.3$, $P = .71$) but were less likely to have a chronic disease (26% vs 36%, respectively; $\chi^2 = 4.3$, $df = 1$, $P = .037$).

Table 3 shows univariate and multivariable associations between the outcome variable—medication compliance—and the consultation variables. All analyses control for the effect of the clustered design. The trust score was associated with medication compliance in univariate analysis, but this association lost statistical significance after further adjustment. In multivariable logistic regression analysis, physician-patient concordance was independently related to medication compliance. Source of care was also independently related to medication compliance, but the association was not consistent, as in univariate analysis there was no significant relationship identified. We found an interaction effect between patient's sex and physician-patient concordance; specifically, the association of physician-patient concordance with compliance was stronger for women.

DISCUSSION
Principal Findings

Patients reporting high levels of concordance with the physician were one third more likely to be compliant in taking medications prescribed during that consultation. In contrast, continuity of care measures, trust in the physician, and enablement were not consistently or not independently related to compliance with medications.

Study Strengths and Weaknesses

This study was a preplanned evaluation of the impact of attributes of primary care, using validated measures where possible, on compliance with medication. The representative sample of primary care patients and high initial response rate add validity. The analytical techniques used took into account the impact of the clustered sampling frame used in patient selection and adjusted for health and demographic variables, whereas previous studies have reported results from unadjusted analyses.[16,25]

Our results should be interpreted with caution because medication compliance was based on self-report, a commonly used but crude measure that may be limited by patients' desire to appear compliant. Pill counts and pharmacy audits were beyond the scope of this study. In addition, the measure of physician-patient concordance used in this study has not previously been validated, and responses showed a potential ceiling effect. Perceived concordance between physician and patient as measured in this study was high in contrast to that in some studies[14,26] but comparable to that in others.[27] Despite these limitations, the finding that physician-patient concordance is related to an important outcome is in agreement with findings of other studies[10,12] and is worthy of further exploration. An important addition to further study would be the physician's perception of physician-patient concordance.

This study may have been limited by response bias in that a sizable minority of the patients who were given a prescription during the consultation was unable to complete a follow-up telephone call. Reassuringly, these patients were indistinguishable from the main sample, and therefore their responses may have been similar.

Comparison With Published Findings

Compliance with medications is a key outcome of primary care consultations. The primary care

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Table 3. Relationship Between Consultation Attributes and Compliance With Medications (the Dependent Variable) in Logistic Regression Analysis (N = 172)

Consultation Variable	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)
Trust in Physician Scale score	1.07 (1.02-1.12)	1.04 (0.99-1.10)
Continuity of care		
UPC Index	0.90 (0.97-1.01)	0.99 (0.97-1.02)
Usual source of care	2.87 (0.86-9.60)	5.98 (1.88-19.03)
Length of care with same doctor	0.94 (0.74-1.19)	0.86 (0.68-1.09)
Importance of seeing same doctor each visit	0.86 (0.56-1.30)	0.80 (0.51-1.25)
Enablement Index	1.03 (0.99-1.08)	1.05 (0.98-1.12)
Physician-patient concordance score	1.21 (1.05-1.39)	1.34 (1.04-1.72)†

Note: All analyses are adjusted for clustering.

OR = odds ratio; CI = confidence interval; UPC = Usual Provider Continuity.

* Logistic regression adjusted for age, sex, ethnicity, education, perceived financial status, EuroQol 5-dimensional questionnaire (EuroQol-5D) score, and number of visits in the last year.

† After addition of an interaction term for sex and doctor-patient concordance to the model, OR = 1.74 (95% CI, 1.25-2.43).

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physician is the key coordinator of prescribing, and correlates of this outcome will be useful in designing interventions to improve compliance.

Patterns in the source of care, usual provider continuity, and reported importance of continuity are comparable between our sample and a sample of US primary care patients.[16] Medicaid populations have been found to have lower levels of continuity of care, but continuity was associated with fewer hospitalizations.[6] Our finding that various continuity measures were not associated with compliance is surprising and contrary to the findings of previous research.[25] We concur with Christakis[28] that continuity may operate differently in different populations and that relatively high levels of continuity and quality of care might combine to create a ceiling effect, concealing the impact of continuity evident in other subpopulations.

As with continuity of care, levels of trust in one's physician are similar among patients in the United States, the United Kingdom,[16] and New Zealand. In this study, trust was not independently associated with medication compliance, nor was enablement, which questions their utility as markers of quality in primary care.[5]

Implications for Practice, Policy, and Future Research

This study is the first to add medication compliance to the outcomes positively related to physician-patient concordance,[10,12] and our findings suggest that efforts to facilitate physician-patient concordance may improve primary care outcomes. Ensuring that the patient understands the physician, that there is agreement about the nature of the patient's problem, and that management is acceptable will require excellent communication skills, especially listening skills. These skills could be a focus for educators, planners, and evaluators.

In conclusion, this study points to the importance of concordance in the physician-patient relationship during the delivery of primary health care and extends previous work by exploring various dimensions of the relationship simultaneously. Whether the physician-patient concordance is improved by using the patient-centered method[29] may be a fruitful avenue for research.

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