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PHYSICIANS' PARTICIPATORY DECISION-MAKING AND QUALITY OF DIABETES CARE PROCESSES AND OUTCOMES: RESULTS FROM THE TRIAD STUDY

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Abstract

BACKGROUND—In participatory decision-making (PDM), physicians actively engage patients in treatment decisions. Previous studies suggest that patients who report that their physicians engage in PDM have better disease self-management and health outcomes. We examined whether *physicians'* diabetes-specific treatment PDM preferences as well as their self-reported practices are associated with the quality of diabetes care their patients receive.

METHODS—2003 cross-sectional survey and medical record review of a random sample of diabetes patients (n = 4198) in ten health plans and their physicians (n = 1217). We characterized physicians' diabetes treatment PDM preferences and practices as “no patient involvement,” “physician-dominant,” “shared,” or “patient-dominant” and conducted multivariate analyses examining their effects on the following: 1) three diabetes care processes (annual hemoglobin A1c test; lipid test; and dilated retinal exam); 2) patients' satisfaction with physician communication; and 3) whether patients' A1c, systolic blood pressure (SBP), and low-density lipoprotein cholesterol (LDL) were in control.

RESULTS—Most physicians preferred “shared” PDM (58%) rather than “no patient involvement” (9%), “physician-dominant” (28%) or “patient dominant” PDM (5%). However, most reported practicing “physician-dominant” PDM (43%) with most of their patients, rather than “no patient involvement” (13%), “shared” (37%) or “patient-dominant” PDM (7%). After adjusting for patient and physician-level characteristics and clustering by health plan, patients of physicians who preferred “shared” PDM were more likely to receive A1c tests [90% vs. 82%, AOR: 2.05, 95% CI: 1.03-3.07] than those of providers who preferred ‘no patient involvement in treatment decision-making. There were no differences in patients' satisfaction with their doctor's communication or control of A1c, SBP, or LDL depending on their physicians' PDM preferences.

Physicians' self-reported PDM practices were not associated with any of the examined aspects of diabetes care in multivariate analyses.

CONCLUSIONS—Patients whose physicians prefer a shared decision-making style are more likely than patients whose physicians prefer more physician-directed styles to receive some recommended risk factor screening tests, an important first step toward improved diabetes outcomes. Involving patients equally in treatment decision-making alone, however, appears not to be sufficient to improve biomedical outcomes.

Keywords

Diabetes; Quality of Care; Patient-Physician relations; Medical decision-making

Background

Participatory decision-making (PDM) is a model in which physicians actively engage their patients in medical treatment decision-making. Ideally, PDM involves presenting patients with the best available evidence; explicitly considering patients' values, goals, and capabilities; offering options; and arriving at mutually agreed-upon treatment plans. Patients' perceptions that their provider involves them in treatment decision-making have been associated with improved health outcomes, better disease self-management, and higher levels of patient satisfaction.¹⁻⁵ Other studies suggest that patients who are active participants in the process of their care have improved medical outcomes.^{2,6-9}

Because of this body of evidence, advisory bodies such as the Institute of Medicine recommend that physicians encourage patients to be active participants in the process of their care and in clinical decision making.¹⁰ Prior studies have used patient reports of the extent to which their physicians have involved them in different aspects of decision-making or audiotaped patient-physician encounters and categorized physician and patient communication styles. There are few studies, however, of physicians' preferred PDM styles or self-reported PDM practices, and there are no studies on whether physicians' preferred or reported PDM practices are associated with higher quality of care. Without data from physicians on PDM, it remains possible that prior studies of PDM have actually measured some other aspect of patients' attitudes toward their physicians, such as satisfaction or some other dimension of communication.¹ To more accurately assess the effect of PDM on patient care requires the examination of physicians' accounts of their PDM style.

Furthermore, a number of factors raise questions about the relative importance of physicians' efforts to share decision-making with different types of patients (PDM preferences) compared with the success of these efforts (actual PDM practices with most patients). Multiple prior studies suggest that many patients, especially patients with chronic diseases such as diabetes and older patients, independent of health status, often prefer less participation in treatment decision-making.^{4,11-16} Because of this, physicians who prefer more PDM but do not necessarily practice PDM with most of their patients may be more actively eliciting patient preferences for participation and adapting their styles better to match their patients,¹⁷ possibly leading to better results than physicians who practice more inflexible styles. Studies to date, however, have not explored the association between physicians' PDM preferences and practices and their patients' receipt of recommended processes of care and diabetes outcomes.

To address this gap in knowledge, we sought to examine the association between physician report of their PDM preferences and practices and patient receipt of three recommended diabetes care processes (A1c testing, eye exam, lipid check) that we hypothesized would be influenced by physicians' preferred and actual PDM, overall patient satisfaction with

physician communication, and intermediate diabetes care outcomes (A1c, blood pressure, LDL control). We hypothesized that patients of physicians who preferred more participatory PDM styles would be more likely to have received recommended diabetes processes of care that require proactive patient follow-up such as getting recommended lab tests or a dilated eye exam. We further hypothesized that, after adjusting for other patient confounders, patients of physicians who preferred more PDM styles would have better risk factor control than patients of physicians who preferred less PDM styles. Moreover, given that previous studies have documented that some patients with diabetes may prefer less PDM, we hypothesized that physician preferences for PDM rather than actual practices of PDM would be more strongly associated with the aspects of care we examined. We anticipated truly participatory physicians might be more responsive to patient preferences for participation, and may be more adaptive to a patient's preferred style, even if this results in the physician *practicing* less patient participation in decision-making than they might prefer. In order to address possible residual confounding—i.e., that some other physician characteristic besides PDM influenced patients' decisions to follow-up on recommended services—we also examined diabetes care processes such as in-clinic receipt of blood pressure checks and foot exams that would not be dependent on patient follow-up.

Methods

Overview of the TRIAD Study and Sample

We examined linked surveys from physicians and patients along with patients' medical record data from the Translating Research into Action for Diabetes (TRIAD) study, a multi-center study of diabetes care in managed care. TRIAD's sampling frame, methods, key hypotheses, and power calculations are detailed elsewhere.^{18,19} TRIAD consists of 6 collaborating Translational Research Centers (TRCs) partnered with 10 managed care health plans. The TRIAD study was reviewed and approved by the institutional review boards of each TRC. Informed consent was obtained from all survey respondents. Eligible patients were 18 years of age, community-dwelling, not pregnant, had diabetes for 1 year, spoke English or Spanish, were continuously enrolled in their health plan for 18 months, used 1 service during that time, and could provide informed consent. The study cohort was randomly sampled from patients belonging to the ten participating health plans who were identified from claims, lab, and administrative data. The TRIAD study cohort was surveyed in 2001 (n = 11,927, CASRO response rate 69%)²⁰ and again in 2003 (retention rate 74%). In addition, TRIAD mailed surveys to the primary care physicians identified by participating patients in their 2003 surveys; the response rate was 54%. Our final sample included 4,198 patients for whom follow-up TRIAD data were available and whose primary care physician (N=1217) completed a survey during the same period. To determine whether patients had received A1c testing, dilated eye exam, lipid test, blood pressure checks, and foot exams, we used centrally trained reviewers and standardized data collection software to abstract process measures (see below), as well as most recent levels of hemoglobin A1c (A1c), low-density lipoprotein cholesterol (LDL), and systolic blood pressure (SBP). Inter-rater reliability (kappa) for the main quality measures ranged from 0.86 to 0.94.

Data Sources

Outcome Measures—We examined process measures that required some degree of patient follow-up and participation (e.g., making an appointment and/or completing a return visit for evaluation or testing). Thus, we examined whether patients received dilated eye exams (as either reported by the patient or noted in the medical record), as well as A1c and lipid tests performed within the past year (determined through medical record review). In alternative analyses, we also examined care processes such as foot exams or blood pressure checks that would occur in the visit itself. We did not include proteinuria assessments

because the different health plans in our study observed different guidelines for these tests (e.g., if proteinuria had been documented and patients were on an Angiotensin Converting Enzyme (ACE) Inhibitor, some plans did not recommend testing for proteinuria). We also examined patients' reported satisfaction with provider communication. Because patient satisfaction was highly skewed toward positive evaluations, patient satisfaction measures were dichotomized versions of the Consumer Assessment of Health Plans Study Version 1.0 scores for how well the patient felt his or her doctors communicated; 1 denoted the best possible score and 0 denoted all other scores.²¹ Intermediate outcomes of diabetes care were the most recently recorded values in the prior year of A1c, LDL and SBP. Values were recoded as binary variables for patients at or below specified target levels (<8.0% for A1c; <140 mm Hg for SBP; and <130 mg/dL for LDL).

Independent Variables—The primary independent variable was physicians' self-reported preferences for PDM. To measure physicians' preferred PDM style, we asked respondents to "check the one statement that best describes how in general you would PREFER to make decisions about treatment for your patients' diabetes." The five response categories, ranging from more physician-determined to more patient-oriented styles were: "I prefer to make decisions regarding treatment based on my medical judgment;" "I prefer to make the final decision about treatment, but seriously consider the patient's opinion;" "I prefer to share responsibility with patients for deciding which treatment is best for them," "I prefer for patients to make final selections of treatment after seriously considering my opinion," and "I prefer patients to make the final selection about treatment with little input from me." Because no physicians chose the final category, we included only the first four categories in our analyses.

We also conducted alternative analyses using physician reports of what they *actually practiced* with most patients. For this analysis, we used responses to a second question that asked about which of the same response categories detailed above "best described how you currently make diabetes treatment decisions with MOST of your patients with diabetes." Again, no physicians chose the final category.

Patient covariates included age, gender, race/ethnicity, education, income, diabetes duration, and type of diabetes treatment (diet-controlled, oral agents only, oral agents +/- insulin). Physician covariates included gender, race/ethnicity, specialty, and age.

Statistical Analyses

We performed logistic regression analyses to examine the association between physicians' self-reported PDM preferences and practices and each process measure and intermediate outcome. Values were missing for less than 5% of all covariates except for income (missing 11%). We used single imputation methods to generate missing covariates (but not the dependent or primary independent variables), using transcan function in S-PLUS Version 6.1 (Seattle, WA), with each covariate predicted as a function of all other covariates in the model. When the primary independent variable or dependent variables were missing, the patient was dropped from the models. Twenty-nine percent of patients in the sample were missing record data on the performance of A1c and lipid tests and on intermediate outcomes, but none were missing information on dilated eye exams, which were measures by self-report or medical record data.

We used hierarchical logistic models (SAS NLMIXED with full maximized likelihood estimation) to account for clustering of patients within physicians and health plans. Health plan effects were modeled as fixed effects and clinician effects were modeled as random effects.²² Models were adjusted for patient-level and physician characteristics. Analyses

were performed using SAS version 9.1 statistical software (SAS Institute, Inc., Cary, NC), and predicted probabilities were reported.

Results

Analytic Sample

Patients averaged 62 years of age; 55% were women, 40% white, 54% had a high school education or less, and 60% had annual incomes below \$40,000 (Table 1). Patients had an average diabetes duration of 12 years, and 58% were on oral medications only. Physicians averaged 49 years of age, 36% were female, 60% White, 90% were in Internal Medicine or Family Medicine and had been in practice on average 19 years.

Over half of providers (58%) reported a preference for equally sharing decision-making with patients, though 9% preferred to make decisions alone, and 28% preferred to make treatment decisions after considering the patient's opinion. As hypothesized, fewer physicians reported *practicing* shared treatment decision-making with most patients (37%), with 56% reporting more physician-dominant styles. While there was concordance between providers' preferred and actual (*as practiced*) PDM styles for 59% of physicians, 27% reported most commonly *practicing* a decision-making style that was less participatory than they preferred. Female physicians were significantly more likely than male physicians to report a preference for more participatory PDM and also reported greater practice of equally shared decision-making. No other physician characteristics were significantly associated with differences in reported PDM preferences or practices.

Performance of processes of care was relatively high (Table 2). The rates ranged from 52% of patients having received a lipid test in the recommended interval to 86% having had an A1c tested. Intermediate outcomes were not optimal (Table 2). The majority of patients reported high satisfaction with physician communication (59%).

Association of Physicians' PDM Preferences and Practices with Processes of Care and Intermediate Outcomes

In unadjusted analyses, higher rates of patients whose physicians' preferred equally shared treatment received A1c and lipid tests and dilated eye exams than patients of physicians who preferred little patient participation (Table 3). There were no differences in receipt of foot exams or blood pressure tests. After adjusting for patient and provider-level characteristics as well as clustering by health plan, physician preference for shared decision-making was associated with higher odds of their patients having received an A1c test (predicted probability of 90% vs. 82%). Although predicted probabilities and adjusted odds ratios of receiving a lipid test and dilated eye exam were higher for patients of providers who preferred shared decision-making compared to patients of providers who preferred to make treatment decisions alone, the 95% confidence intervals for these analyses crossed 1.0 (Table 3).

In both unadjusted and adjusted analyses, there were no differences between the groups in satisfaction with provider communication or in intermediate outcome levels (results not shown). Similarly, there were no significant associations in bivariate or adjusted analyses between providers' reported *practices* of PDM with most patients and any of our diabetes care processes or outcomes.

Discussion

Among this diverse sample of diabetes patients cared for in a variety of managed care settings, higher rates of patients whose physicians who preferred shared diabetes treatment

decision-making received A1c, lipid, and dilated eye exam screens than patients of less participatory physicians. After adjusting for both patient and provider characteristics, as we hypothesized, physicians' PDM preferences remained independently associated with higher rates of their patients having received A1c tests, with a trend toward statistical significance for the other two screening tests. This association did not appear to be mediated through increased patient satisfaction with providers' communication—as there was no association between providers' preferred PDM and patients' reported satisfaction—or between patients' level of satisfaction and receipt of any of the diabetes care processes. There was also no association between PDM preferences and achieved intermediate outcomes.

This is the first study to explore the association between physicians' reported preferences for PDM and crucial aspects of diabetes care among their patients. The findings of several recent studies have suggested that patient perceptions of patient centeredness or patient-MD congruence of interviewing styles are better predictors of trust, visit satisfaction,²³⁻²⁵ and medical outcomes than is actual MD patient centeredness. We and others have found an association between patients' report of PDM and enhanced patient self-management and self-efficacy.^{1,8,26} Other studies have found patient reports of more participatory provider styles to be associated with certain 'provider-controlled' aspects of care, such as the duration of visits and the provision of action plans, but not with other more 'patient-dependent' activities such as adherence to antiretroviral therapy.^{27,28} Using physician reports, we found a statistically significant association between a shared decision-making preference and better quality of care for receipt of an A1c test. In this regard, our results support the findings of improved outcomes in prior studies that have relied exclusively on patient reports.¹⁻⁴ The magnitude of observed differences was modest but comparable to differences achieved in efficacy trials of individual disease management interventions.^{29,30}

These findings support the hypothesis that encouraging shared patient involvement in decision-making may increase patients' understanding and motivation to follow up on recommended screening tests, even if many patients do not participate as actively in decision-making as their physicians would prefer. Future research needs to determine the ways in which PDM may influence patient follow up on recommended tests. One hypothesis is that encouraging shared patient involvement in treatment decision-making leads to greater patient commitment and motivation to following up on physicians' recommendations.^{31,32} Unlike in prior studies that relied on patient accounts of their providers' PDM,^{27,33} however, physicians' reported PDM preferences and practices were not associated with patients' reported overall satisfaction with physician communication. This finding suggests that greater satisfaction would not appear to be the mediator between PDM and better follow-up on recommended tests. Finally, it is also possible that physicians' PDM preferences constitute a surrogate for a particular type of provider - one who may be both more thoughtful of patient preferences and more attentive to care guidelines and providing high-quality care. If this were the case, however, one would also expect to find higher rates of foot exams and blood pressure checks among these physicians' patients—which we did not find.

Physicians' PDM preferences and reported practices did not have a clinically meaningful independent effect on patients' achieved intermediate outcomes. This null finding is similar to those of studies examining quality of diabetes care that have shown that improved process delivery does not always translate into improved outcomes.³⁴ For example, a recent TRIAD study in this same population found disease management programs implemented in TRIAD physician groups were associated with higher levels of care processes but not with improved intermediate outcomes nor the medical management of these outcomes.³⁵ Multiple factors influence achievement of improved intermediate outcomes, including disease severity, external facilitators and barriers to patient self-management, medication adherence, and

appropriate physician intensification of medication regimens. Our findings are consistent with the hypothesis that PDM may contribute to several important necessary ‘steps’ toward improved diabetes outcomes, but it alone may not be sufficient to improve biomedical outcomes.

Our findings also supported our hypothesis that physician PDM preferences would be more significantly associated with our examined outcomes than their reported practices with most patients. Multiple studies have found that patients with diabetes and older patients prefer to be less involved in treatment decision-making than do healthy, younger adults.^{11,36-39,40,41} Several recent studies, however, have found that even patients who report that they do not want to participate in decision-making do better when their providers seek to involve them in decision-making.^{11,42} While explanations are speculative, physicians with participatory preferences may not be sharing decision-making as much as they prefer because of patient preferences, but may be actively encouraging these patients to be more engaged in their care. It is possible these providers may be responding to patients’ preferences for participation, which in turn may increase patient trust and propensity to adhere to physician recommendations and thus follow-up. Our findings thus support recommendations that physicians encourage greater patient participation in treatment decision-making, even if a high level of patient participation is not achieved in practice. It is also possible that although many physicians report a preference to practice shared PDM, the current structure of healthcare is not conducive to shared decision-making. The discordance between preferences and practices may reflect systems barriers as much as they represent discordant patient perceptions. In a more supportive system for shared PDM, practiced PDM may be more efficacious and effective.

Several limitations of this study should be noted. First, this study is cross-sectional and therefore the associations observed cannot be interpreted as causal. As with all such studies, there may be some other unmeasured characteristic of physicians who state a preference for PDM that explains the differences in the outcomes for which we found significant differences (e.g., these physicians may also be more likely to refer patients for dilated eye examinations). Second, we had significant amounts of missing data for many of our measured outcomes. Survey data indicated that patients with missing medical record data were quite similar to the remainder in terms of demographic characteristics, duration of diabetes, and self-reported health status. Third, we only included individual-level patient and physician characteristics as adjusters in our multivariate analyses. Prior work has suggested, however, that PDM is not only associated with physician characteristics but also with practice-related characteristics (e.g., practice volume).⁴³ We did not have this type of information available in this study. At a higher level, while we did not include organizational variables in the models, we did adjust for health plan clustering as a fixed effect, using very conservative fixed effects models that just estimated variation among physicians within health plans rather than between plans and adjusting for both patient and physician characteristics. Finally, we did not have data on patients’ PDM preferences or their evaluations of their physicians’ PDM style. There could be some self-selection in that patients preferring more participation (and who may be more likely to follow up on recommended tests) might have been matched with physicians with more participatory preferences. Ideally, future studies will include data on both patient and physician preferences, reported practices and observation of how these preferences are played out in patient encounters. Nevertheless, even if self-selection occurred, we did observe better processes of diabetes care among patients of physicians who preferred to share responsibility for decision-making.

In summary, physician preferences for PDM were associated with patients’ receipt of important diabetes care processes, but not with satisfaction with care or intermediate

outcomes. Further research is needed to determine if these associations hold in prospective studies, to understand why PDM is not associated with intermediate outcomes, to explore the mechanisms through which physicians' PDM preferences may influence their patients' receipt of recommended diabetes processes of care, and to understand which sub-sets of patients most prefer and may be influenced positively by PDM.

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Article Points

Previous studies suggest that patients who report that their physicians engage in PDM have better disease self-management and health outcomes. We examined whether *physicians'* diabetes-specific treatment PDM preferences as well as their self-reported practices are associated with the quality of diabetes care their patients receive. We found that Patients whose physicians prefer a shared decision-making style are more likely than patients whose physicians prefer more physician-directed styles to receive some recommended risk factor screening tests, an important first step toward improved diabetes outcomes. Involving patients equally in treatment decision-making alone, however, appears not to be sufficient to improve biomedical outcomes.

Table 1**Patient and Physician Characteristics**

Measure	% or Mean (SD)
Patient characteristic (n=4198)	
Age (years)	62 (13)
Duration of diabetes (years)	12 (11)
Female	55
Race or Ethnicity	
Hispanic	14
Black	17
White	40
Asian or Pacific Islander	19
	10
Education	
Some high school	23
High school	31
Some college	27
4 yrs college	19
Income (in thousands of dollars)	
<15	25
15-39	33
40-75	25
>75	17
Treatment	
Diet only	7
Oral medication	58
Insulin	19
Insulin + oral	16
Physician characteristics (N=1217)	
Age (y)	49 (10)
Practice (y)	19 (10)
Male	72
White	60
Specialty	
Family medicine/general practice	36
Internal medicine	54
Other	10
Preference for making decisions about treatment	
My judgment	9
Consider patient's opinion but I make decision	28
Share responsibility	58
Patient makes decision after considering my opinion	5

Measure	% or Mean (SD)
How I make treatment decisions with most patients	
My judgment	13
Consider patient's opinion but I make decision	43
Share responsibility	37
Patient makes decision after considering my opinion	7

Table 2

Distribution of Patient-Level Outcomes

<u>Diabetes process</u>	<u>N</u>	<u>%</u>
Glycemic control assessed	2978	86
Lipid profile assessed	4198	52
Dilated eye exam	4198	78
<u>Other process measure</u>		
Satisfied with communication with physician (highest category)	3825	59
<u>Intermediate outcome</u>		
Hemoglobin A1c out of control (≥ 8.0%)	2745	38
Low-density-lipoprotein cholesterol out of control (> 130 mg/dl)	2466	23
Systolic blood pressure out of control (> 140 mm Hg)	2806	39

Table 3

Unadjusted and Adjusted Associations between Physicians' Preferences and Practices with Most Patients with Respect to Decision Making and Processes of Care

A. Physicians' Reported Preference for Decision Making			
Model	Unadjusted Rate %	Predicted Probability (Adjusted) * %	Adjusted Odds Ratio (95% Confidence Interval) *
Process measure			
Glycemic control assessed			
My judgment	83	82	1.00
Consider patient's opinion	87	88	1.69 (0.80-2.57)
Share responsibility	89 [†]	90 [†]	2.05 (1.03-3.07) [†]
Patient's decision after considering my opinion	86	86	1.38 (0.39-2.37)
Lipid profile assessed			
My judgment	70 (47)	50	1.00
Consider patient's opinion	70 (53)	56	1.32 (0.90-1.75)
Share responsibility	75 (52)	54	1.13 (0.86-1.49)
Patient's decision after considering my opinion	74 (61)	60	1.58 (1.04-2.39)
Dilated eye exam			
My judgment (Reference)	75	75	1.00
Consider patient's opinion	77	77	1.13 (0.76-1.49)
Share responsibility	80	80	1.39 (0.96-1.82)
Patient's decision after considering my opinion	75	74	0.95 (0.53-1.38)
Patient Satisfaction with Doctor's Communication			
My judgment (Reference)			1.00
Consider patient's opinion			1.05 (0.73-1.37)
Share responsibility			1.23 (0.87-1.58)
Patient's decision after considering my opinion			1.38 (0.78-1.98)
B. Physicians' Reported Decision making Practice with Most Patients			
Model	Unadjusted Rate (%)	Predicted Probability (Adjusted) * (%)	Adjusted Odds Ratio (95% Confidence Interval) *
Glycemic control assessed			
My judgment	59	62	1.00
Consider patient's opinion	62	64	1.09(0.82-1.37)
Share responsibility	60	64	1.08 (0.79-1.36)
Patient's decision after considering my opinion	69	72	1.65 (0.96-2.34)
Lipid profile assessed			
My judgment	51	54	1.00
Consider patient's opinion	52	54	1.00 (0.73-1.26)
Share responsibility	52	54	1.01 (0.73-1.28)
Patient's decision after considering my opinion	58	60	1.29 (0.75-1.83)
Dilated eye exam			
My judgment	74	75	1.00

A. Physicians' Reported Preference for Decision Making			
Model	Unadjusted Rate %	Predicted Probability (Adjusted)[*] %	Adjusted Odds Ratio (95% Confidence Interval)[*]
Consider patient's opinion	77	77	1.11(0.82-1.39)
Share responsibility	81	80	1.35 (0.98-1.73)
Patient's decision after considering my opinion	84	81	1.43 (0.81-2.05)

All Models account for clustering by physicians and health plans.

^{*} Adjusted for characteristics of patients (age, sex, race or ethnicity, income, duration of diabetes, and treatment) and physicians (age, sex, race or ethnicity, and specialty).

[†] Statistically significant.

[‡] p<0.05