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Quality of physician-patient relationships is associated with the influence of physician treatment recommendations among prostate cancer patients who chose active surveillance

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Summary

Objective—With growing evidence that some men with prostate cancer may be over-treated, clinicians need greater knowledge of the factors that influence uptake of treatment recommendations in general, and specifically, uptake of active surveillance in patients for whom this is an appropriate treatment option. The objective of this study was to test the role of the quality of the physician-patient relationship in the choice to be followed by active surveillance, rather than receive definitive therapy (e.g., surgery, radiation). We hypothesized that patients would have been more influenced by their physicians' treatment recommendations to the degree they held more positive perceptions of their relationship with their physicians, independent of treatment recommended.

Methods and Materials—Prostate cancer patients (N=120) being followed with active surveillance at a comprehensive cancer center completed self-report assessments of their treatment decision-making process. Generalized Estimating Equations were used to model the association between participants' perceptions of their relationships with their physicians and influence of these physicians' recommendations on their treatment decision.

Results—After controlling for the type of treatment recommended, Gleason score, and education, three predictors, trust in the physician, perceived closeness with the physician, and the degree to which the physician shared control over treatment decision-making, were associated with greater influence of physician's treatment recommendation. Receiving a recommendation for

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active surveillance, compared to definitive therapy was also associated with higher perceived trust, closeness, shared control over treatment decision-making, lower likelihood of having been treated poorly by a physician, and greater influence of physician's treatment recommendation.

Conclusions—There is increasing concern that patients with relatively less aggressive prostate cancer, older age, or serious comorbidities are being unnecessarily treated with surgery or radiation, putting them at risk for side-effects and contributing to high healthcare costs. When active surveillance is an appropriate course of treatment, the quality of patients' relationships with their physicians may be a determinant of following a recommendation for active surveillance. Results may have implications for treatment uptake in general, indicating that the quality of the physician-patient relationship, including trust, closeness, shared decision-making -all elements of patient-centered care- may be important motivators of treatment adoption and adherence.

Key works

prostate neoplasms; watchful waiting; decision-making; physician-patient relations; trust; patient compliance

Introduction

Historically, fewer than 10% of prostate cancer (PCa) patients have been followed with watchful waiting/active surveillance, rather than being treated with definitive therapy (typically prostatectomy, external beam radiation, or brachytherapy) [1,2]. There is growing consensus that this number is inappropriately low as evidence indicates that some PCa patients have been over-treated, resulting in unnecessary decrements in the quality of patients' lives, and financial cost [1,2,3,4].

The reasons for over-treatment may be several-fold. Due to lack of adequate clinical or molecular markers for differentiating indolent and aggressive cancers, [5] and high quality evidence upon which to evaluate alternative treatments, clinical care has tended to err on the side of aggressiveness [6]. It is also speculated that financial incentive to health care providers and systems may also play a role in recommending surgery or radiation [6]. However, over-treatment may, in part, be motivated by patient preferences that are not based in accurate understanding of the risks and impact of treatment side-effects, [7] and dramatically over-estimate the benefits of definitive therapy for survival [8]. Indeed, patients have been found to choose aggressive treatment with little regard for trade-offs [9].

There is increased interest in identifying factors that increase the likelihood of patients choosing active surveillance when it is clinically appropriate and consistent with their values and preferences [9,10]. Physician recommendations have been identified as the strongest predictor of treatment choice among PCa patients, [7,10] including among men on active surveillance [11]. The purpose of the present study was to examine qualities of the physician-patient relationship associated with greater influence of physician treatment recommendations, among PCa patients who ultimately chose active surveillance.

Multiple factors likely determine the influence of physicians' treatment recommendations, including characteristics of the physician (e.g., specialty, reputation); characteristics of the

care process (e.g., number of different specialists consulted); characteristics of the patient (education, health literacy, decision-making preferences); and quality of the physician-patient relationship, the focus of the present research. A growing body of literature indicates that patient-centered care, including patient involvement in information sharing, and other aspects of shared decision-making, physician empathy, and physician responsiveness are important for promoting treatment adherence [12,13,14]. We hypothesized that PCa patients would be more influenced by their physician's treatment recommendation to the degree that they trusted their physician, felt close to their physician, perceived their physician shared decisional control, and did not perceive that they were treated poorly by their physician.

Methods and Materials

Procedure

Study procedures were approved by Institutional Review Boards at each of the authors' affiliated institutions and participants completed a written informed consent. PCa patients with clinically localized disease being followed with active surveillance at a comprehensive cancer center were approached and consented between July 2010 and June 2012 at routine follow-up visits. We approached all previously diagnosed patients being followed with active surveillance at the facility. One hundred and twenty-six participants consented to participate (25.4% refusal rate). Participants completed two self-report paper and pencil questionnaires about their treatment decision-making process and personal characteristics either in clinic or at home. Responses were dropped for six individuals who did not complete both questionnaires, yielding a final sample of 120 individuals.

Measures

Predictor variables—As PCa patients often consult more than one physician prior to making their treatment decision, we asked participants to rate their relationships with up to five physicians (2 urologists, 2 radiation oncologists, 1 primary care physician), depending on how many they had consulted. They filled out the same set of retrospective ratings for each physician. For each physician, they rated how much they trusted the physician using Kao and colleagues' patient trust in physician scale [15] and the degree to which the physician shared control over treatment decision-making on the 3-item Participatory Decision-Making (PDM) scale [16]. The PDM scale is typically scored out of 100. We have retained the original scaling in the presentation of descriptive and bivariate results for ease of comparison with other studies, but for the multivariable GEE models, divided scores by 10 to facilitate interpretation of results. Participants rated perceived closeness with each physician using an adapted Inclusion of Other in Self Scale (IOS) in which participants chose between degrees of relationship closeness represented by two increasingly overlapping circles identified as the patient and the physician [17]. To assess whether participants perceived that they had been treated poorly by their physicians, they were asked for each physician if, "thinking about your experiences with this doctor, did you feel uncomfortable or were you treated badly? (yes/no)". For those who indicated that they had, a follow-up question asked, "do you think you felt uncomfortable or were treated badly because of (health or disability/sexual orientation/race or ethnicity/height or weight/income level/ age/other)?"

Outcome variable

Influence of treatment recommendations—The extent to which a given physician’s treatment recommendation influenced a participant’s treatment choice was assessed with the item: “how much was your decision influenced by the urologist’s/radiation oncologist’s recommendation? (Not at all/ A little/Quite a bit/Very much)”.

Covariates

Treatment recommendations—Participants were asked to indicate, with respect to each physician from whom they had received a treatment recommendation, the treatment recommended (active surveillance/surgery/external beam radiation/brachytherapy/cryotherapy). Only one participant received a recommendation for cryotherapy; therefore, whether or not cryotherapy had been recommended was not included in the multivariable models. Multivariable models included three binary variables: whether participants had received a recommendation for a) active surveillance, b) prostatectomy, and c) external beam radiation or brachytherapy from a given physician.

Demographic and clinical characteristics—Participants completed standard questions about years of education completed, household income, marital status, employment status, age, and race/ethnicity. They were also asked to self-report date of diagnosis and PSA at time of diagnosis. Cancer grade (Gleason score) and stage at start of treatment was extracted from patients’ medical records. For the purpose of describing the sample (Table 1), we used a categorical education variable (< high school/ high school/some college / college), but a continuous education variable was entered into multivariable models (years of education).

Data Analysis

We used bivariate and multivariable analyses to test for relationships between the quality of the patient-provider relationship (trust, closeness, shared decision-making, poor treatment by physician) and the influence of physician’s treatment recommendations. The unit of analysis for these tests was the physician-patient dyad, for which most participants reported on more than one. For each participant, data from up to two urologists and two radiation oncologists were analyzed. Data for primary care physicians were excluded given that, although many participants talked with their primary care provider about their prostate cancer, few (9/120; 7.5%) reported receiving treatment recommendations from them.

We used t-tests, a chi-squared test to examine the bivariate association between patient-provider relationship factors (i.e., trust in physician, closeness with physician, shared decision-making, poor treatment by physician) and influence of treatment recommendations. For the purpose of these comparisons we dichotomized the influence variable into 0 (‘not at all’ or ‘a little’) and 1 (‘quite a bit’ or ‘very much’). We used one-way analysis of variance followed by Scheffé contrasts or chi-squared tests to examine bivariate associations between type of treatment recommended and the patient-provider relationship factors.

We used Generalized Estimating Equations (GEE) [18] to test for associations between each of the predictors and influence of physician treatment recommendations on treatment choice.

Because each patient had recommendations from up to four physicians (mean = 2.2; 7 reported on one; 57 reported on two; 43 reported on three; and 13 reported on four), the physician data was not independent; therefore, specialized models, such as GEE, were needed to deal with the loss of independence [18]. The outcome variable was a limited range count variable (i.e., amount of physician influence); therefore, a negative binomial family was specified within the GEE models. The restrictive assumptions of Poisson model made the negative binomial model a more appropriate choice [19,20]. An exchangeable correlation structure was specified along with robust standard errors. The robust standard errors are used so that if the nature of the correlation structure was not correctly specified, the standard errors would still be valid. Risk Ratios (RR) were reported. Risk Ratios that are greater than 1 are interpreted as increasing the likelihood of an outcome, whereas ratios less than 1 are interpreted as decreasing the likelihood of an outcome. Risk Ratios that are equal to 1 are not significantly associated with either increased or decreased risk.

Using the above approach, we examined four GEE models—one for each of the physician-patient relationship predictors (i.e., trust, closeness, shared decision-making, and poor treatment by the physician). In each, we adjusted for constructs that had either 1) a statistical association with the outcome ($p < .05$) and/ or, 2) a theoretical rationale for being a confounding variable. In bivariate analyses (described below), education and insurance status were related to our outcome; however, only education was included as a covariate because less than 2% of the sample lacked insurance. We controlled for Gleason score because it is the primary indicator of how “bad” the PCa cancer is, and may have influenced participants’ attitudes toward physicians’ recommendations and by extension, physicians themselves. We controlled for type of treatment recommended because the association between patient’s relationship with their physician and influence of treatment recommendation could be confounded by the type of treatment recommended (e.g., patients evaluated physicians who recommend less aggressive treatment more favorably).

Of potential interest is the extent to which each construct used to capture quality of the relationship with the physician uniquely predicted the outcome. To explore this we entered all four predictors, along with education and Gleason score into a multivariable GEE model. Type of treatment recommended was not included to reduce the number of model parameters.

Results

Descriptive Statistics

Participant characteristics—Participants had been followed with active surveillance for a mean of 3.0 years (SD=2.1; range=0.2–13.5). At diagnosis, participant mean age was 64.7 years (SD=6.7; range=49.9–79.8); median self-reported PSA range was 5–9; and most (93.2%) had Gleason 6 disease. Patient demographic and clinical characteristics are presented in Table 1. In bivariate analyses, education was inversely associated with influence of physician’s recommendation (RR=0.99, 95% CI=0.99–1.00, $p=0.014$), such that more years of education was associated with less influence. Of the other demographic and clinical characteristics, only health insurance status was associated with influence of

physician's recommendation; however, there was little variability in insurance status - all but two participants had health insurance coverage.

Physicians consulted—Of the 120 participants, most (113; 94.2%) had consulted more than one physician (urologist or radiation oncologist) about their PCa; the remaining 7 participants (5.8%) only saw one urologist. Fifty-three (44.2%) consulted 2 urologists only and 60 (50.0%) consulted one or more urologists and one or more radiation oncologists. In addition, ninety-seven participants (80.8%) said that they had talked to their primary care physician about their PCa. Ten participants (8.3%) also consulted another physician about their PCa.

Recommendations received—Most participants (107; 89.2%) reported receiving at least one treatment recommendation from either a urologist or radiation oncologist. Very few participants (9/120; 7.5%) received a treatment recommendation from a primary care physician. The majority in the sample (87; 72.5%) received at least one recommendation for active surveillance; 44 (36.7%) received at least one recommendation for prostatectomy; and 57 (47.5%) received at least one recommendation for either external beam radiation, brachytherapy, or both.

Physician-patient relationships—Mean ratings on trust, closeness, and shared decision-making, were 3.94 (SD=1.22) out of 5; 3.69 (SD= 2.23) out of 7; and 64.6 (SD=29.89) out of 100 respectively. Poor treatment by at least one PCa physician was reported by 42.5% (51/120) of the sample. When asked to specify why they thought they had been treated poorly, attributions were made to health (7), sexual orientation (2), race (2), income (1) or age (8). None were made to height or weight. The most common response was 'other' (44), with participants specifying that they felt pressured by the physician to choose definitive therapy, in some cases perceiving that the physician was motivated by profit, and others, attributing poor treatment to the physician's bedside manner or personality.

Bivariate associations between quality of the physician-patient relationship, and influence of treatment recommendations and recommendation type

As shown in Table 2, when patients reported being influenced by a treatment recommendation 'quite a bit' or 'very much', compared to 'not at all' or 'a little', they had significantly higher scores on trust, closeness and shared decision-making, and lower likelihood of being treated poorly by the physician. Type of recommendation received was also associated with trust, closeness, shared decision-making, and poor treatment by physician. Mean trust was higher when participants received a recommendation for active surveillance only ($M = 4.71$, $SD = 0.44$) compared to definitive therapy only ($M = 3.06$, $SD = 1.20$). The same patterns were true for closeness ($M = 5.02$, $SD = 2.00$ versus $M = 2.32$, $SD = 1.70$) and shared decision-making ($M = 81.11$, $SD = 18.61$ versus $M = 45.26$, $SD = 29.26$). Participants reported poor treatment by a physician in 0.91% of instances in which they received a recommendation for active surveillance, and in 42.86% of instances they received a recommendation for definitive therapy. All differences were significant $p < .001$.

GEE Models Examining the Association between Patient-Provider Relationship and the Influence of Treatment Recommendations

We tested the association between each of the relationship factors and influence of recommendations with four separate multivariable models (Table 3). We adjusted for having received a recommendation for active surveillance, surgery, or radiation, Gleason score, and education in all the models. Greater trust in a physician was associated with greater intention to follow his/her treatment recommendation (RR=1.03; 95% CI=1.00, 1.05, $p=.006$). Greater closeness to a physician was associated with greater intention to follow his/her treatment recommendation (RR=1.01; 95% CI=1.00, 1.02, $p<.001$). Greater perceived shared decision-making was associated with greater influence of physician treatment recommendation (RR=1.10, 95% CI=1.03, 1.18, $p=.004$). Perceiving poor treatment was associated with being less likely to be influenced by the physician's treatment recommendation in bivariate analyses (RR=0.88; 95% CI=0.83, 0.92, $p<.001$), but not after adding control variables (RR=0.96, 95% CI=0.91, 1.02, *ns*). Among the covariates, having received a recommendation for active surveillance was associated with influence of physician's recommendation across all four models. None of the other covariates was associated with the outcome.

Are trust, closeness, shared decision-making, and poor treatment independent predictors of influence of treatment recommendations?—When all four predictor variables were entered together, and controlling for years of education and Gleason score, trust (RR=1.03, 95% CI=1.00, 1.05, $p=.04$), closeness (RR=1.01, 95% CI=1.01, 1.02, $p=.004$), and shared decision-making (RR=1.00, 95% CI=1.00, 1.00, $p=.02$), were independent predictors of intentions to follow the physician's treatment recommendation. Poor treatment by physician was not (RR=0.99, 95% CI=0.93, 1.05, *ns*).

Discussion

Multiple facets of the physician-patient relationship—trust, closeness, the degree to which the physician shared decisional control over the treatment decision—were associated with influence of the physician's treatment recommendation. Furthermore, these constructs were not redundant predictors. The findings make a novel contribution to the study of PCa care, where there have been few reports on factors that can help increase uptake of active surveillance among PCa patients when it is clinically appropriate. Most have been focused on the reasons men cite for either choosing or not choosing active surveillance (e.g., desire for cancer control, beliefs about the aggressiveness of the cancer, desire to avoid side-effects) [10]. The present study broadens this field of study by increasing our understanding of the qualities of the physician-patient encounter and relationship that influence uptake of active surveillance.

Our findings also have implications for treatment recommendation adherence in general, including instances where adherence to physician recommendations is critical to patient outcomes (e.g., diabetes, hypertension, HIV). They contribute to a growing body of research that attests to the quality, --and namely the patient-centeredness-- of the physician-patient

relationship in treatment and medication adherence is associated with uptake of physician recommendations [12,13,21].

The field of prostate cancer care strives for patient involvement in PCa treatment decision-making. Guidelines recommend that treatment decision-making for clinically localized PCa be a collaborative decision-making process in which patients and physicians weigh cancer control against potential treatment side effects, [22] while taking into consideration patient values and preferences. Patient involvement in treatment decision-making and greater influence of physician treatment recommendations may seem at odds with one another; however, in the present study they were associated. In a previous study, patients who had taken on a passive role in treatment decision-making, compared to a collaborative or active role, rated their urologist's treatment recommendation as more important [11]. In the present study, however, we found that when physicians are perceived as involving the patient in decision-making, this was associated with greater influence of the physician's recommendation.

Study limitations and future directions

The study sample was recruited from a tertiary care center; all but seven participants (5.8%) had sought out a second opinion regarding their PCa care and most were recruited at the facility where they received the second opinion. Therefore, this group of patients is different from randomly selected PCa patients because most had been motivated to seek a second opinion and had decided not to return to the provider who diagnosed their cancer. The level of negative perceptions of physicians among patients in our sample is likely higher than would be found in representative samples of PCa patients. Indeed, studies bear out that the majority of patients are highly satisfied with their physicians [25]. Nonetheless, because of the relatively high variance in attitudes toward their physicians in this special sample, it offers greater opportunity to identify relationships between qualities of the physician-patient relationship and uptake of treatment recommendations. The relationships that were discovered would be expected to be found the general population of PCa patients, although effect sizes might be smaller in the general population than in our sample.

The primary limitation of the study is that participants' perceptions of their physicians and recall of treatment recommendations and their influence on their treatment decision were assessed retrospectively. Most participants had been diagnosed within five years; however, some participants may have had difficulty accurately recalling aspects of the treatment decision-making process addressed by the survey. Findings should be replicated in a prospective study. In addition, a prospective study would be an opportunity to examine the role of quality of the physician-patient relationship in receipt of guideline consistent, versus inconsistent, care. Another limitation is that participants were a convenience sample and, furthermore, were not matched to patients who chose definitive therapy. Future research should explore whether the relationship between quality of the physician-patient relationship and influence of physician treatment recommendation generalizes to patients who choose definitive therapies. Along similar lines, we recruited a convenience sample that may have had higher socioeconomic status than the general population. Research with a representative sample is needed to determine the generalizability of our findings.

Finally, it should be noted that the effects sizes for the predictors of interest were small, but precise, as indicated by narrow confidence intervals. Small effect sizes were partly due to the scaling of the predictor variables – binary predictors would have produced larger effect sizes.

In our sample of patients who had chosen active surveillance, perceptions of the relationship with the physician were more positive if physicians recommended active surveillance, compared to definitive therapy. This finding raises the question, what underlies patient perceptions of their relationships with their physicians? In the small body of studies in which physician-patient interaction is directly observed, physician behavior has been shown to influence patients' perceptions of their relationships with their physicians, including trust in physicians, [23] and influence adherence [24]; however, few direct-observation studies have been conducted with PCa patients. In addition, we do not know the extent to which patient behavior or patients' initial treatment preferences contributed to perceptions of their relationships with their physicians. When patients have negative views about definitive therapy or positive views about active surveillance prior to meeting the physician, this could influence their perception of a physician who recommends one treatment over the other. Studies in which physician-patient encounters are directly observed, along with assessing patient beliefs and preferences, will be important for better understanding which aspects of physician behavior or patient beliefs ultimately influence treatment choice.

Future research should also investigate possible system-level determinants of trust, physician-patient closeness, and shared decision-making. Facilities may be able to adopt organizational changes that promote both these physician behaviors, and in themselves, increase trust, such as allowing for longer consultations [26]. Although few studies have evaluated whether multidisciplinary clinics have favorable outcomes for PCa care, preliminary evidence indicates that patients seen at these clinics may have high satisfaction [27]. Given that multidisciplinary clinics may also reduce physician bias in treatment recommendations and increase utilization of active surveillance, [27] adopting this model may be another system change that could enhance the quality of the physician-patient relationship and patient treatment decision-making.

Implications

Patient-centered care may be the most important determinant of trust in physicians [15]. Physicians may find training in concrete behaviors they can adopt in order to increase trust, closeness, and shared decision-making among their patients helpful for increasing the likelihood that patients consider active surveillance when it is clinically appropriate. Studies are starting to identify these behaviors, including patient-centered behaviors such as when the physician explores the patient's illness experience, [26] is comforting and caring, encourages question asking, [28] provides as much information as the patients wants, provides information about what to do if symptoms worsen/return, and enables patients to be as involved in the decision-making as they want [29]. These skills could to be taught along the training continuum from medical school to continuing education seminars for residents and attending physicians.

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Table 1

Patient Demographic and Clinical Characteristics (Total N=120)

Characteristic	N	(%)
Education		
< High school	2	(1.7)
High school	34	(28.6)
Some college	18	(15.1)
College	65	(54.6)
Income		
< \$25,000	9	(9.3)
\$25,000–49,999	22	(22.7)
\$50,000–\$74,999	24	(24.7)
\$75,000	42	(43.3)
Employment status		
Employed	35	(29.2)
Retired/Not employed	85	(70.8)
Has health care insurance		
Yes	117	(98.3)
No	2	(1.7)
Marital status		
Married or has partner	87	(73.7)
Single	31	(26.3)
Race		
Black	10	(8.4)
White	107	(89.9)
Asian	2	(1.7)
Self-reported PSA at diagnosis		
4	44	(37.3)
5–9	47	(39.8)
10	14	(11.9)
Gleason Total Score		
6	109	(93.2)
7	8	(6.8)
Clinical T Stage		
T1a	1	(0.9)
T1b	0	(0.0)
T1c	109	(93.2)
T2a	7	(6.0)
Mean age at diagnosis	64.7	(SD=6.7)
Mean years since diagnosis	3.0	(SD=2.1)

Table 2

Mean (Standard Deviation) scores on trust, closeness, shared decision making, and percentage of dyads in which participants experienced poor treatment by physician as a function of influence of treatment recommendation

Variable	Influence of Treatment Recommendation	
	Not at all/A little	Quite a bit/Very much
Trust (range: 1–5)	2.99 (0.13)	4.40 (0.08) ***
Closeness (range: 1–7)	2.10 (0.16)	4.53 (0.18) ***
Shared decision making (range: 1–100)	41.45 (3.14)	75.00 (2.04) ***
Poor treatment by physician (Yes vs. No)	45.24% Yes	8.84% Yes ***

NOTE:

p < .001

Table 3
 GEE Models Examining Patient-Provider Relationship Factors, Treatment Recommendations, and Influence of Treatment Recommendations.

Variable	Trust Model (obs [†] =213; n=101)		Closeness Model (obs=220; n=102)		Shared Decision Making Model (obs=208; n=100)		Poor Treatment Model (obs=221; n=102)	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Trust	1.03**	1.01, 1.05						
Closeness			1.01***	1.00, 1.02				
Shared Decision Making					1.10**	1.03, 1.18		
Poor Treatment by Physician							0.96	0.91, 1.02
Recommendation for Active Surveillance	1.06*	1.01, 1.12	1.08**	1.03, 1.13	1.09***	1.04, 1.15	1.09**	1.04, 1.15
Recommendation for Prostatectomy	0.96	0.93, 1.00	0.97	0.94, 1.01	0.97	0.94, 1.01	0.97	0.93, 1.01
Recommendation for External Beam Radiation/brachytherapy	0.97	0.93, 1.01	0.96	0.92, 1.00	0.98	0.94, 1.03	0.96	0.92, 1.01
Years of Education	1.00	0.99, 1.00	1.00	0.99, 1.00	1.00	0.99, 1.00	1.00	0.99, 1.00
Gleason Score	1.00	0.95, 1.05	1.02	0.97, 1.08	0.99	0.94, 1.04	1.02	0.96, 1.08

NOTE:

*** p< .01;

** p< .01;

* p< .05;

[†] number of observations and number of participants included for each multivariable regression; most participants had multiple observations