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Low self-efficacy is associated with decreased emergency department use in underserved men with prostate cancer

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Abstract

Background: Self-efficacy has been strongly associated with health behavior and health maintenance. We examined the relationship between patient-provider self-efficacy and emergency department usage in low-income, underinsured, or uninsured patients with prostate cancer.

Methods: We prospectively analyzed quality of life, behavior, and self-efficacy data from men enrolled in a state-funded program providing free prostate cancer care. We summarized patient characteristics stratified by self-efficacy scores (high, mid, and low) and by emergency department visit (any vs. none). We conducted a multivariate repeated measures regression analysis with negative binomial distribution to calculate predicted counts of emergency department visits over time across the self-efficacy strata.

Results: Our cohort included 469 men with a maximum follow-up time of 84 months. Of these men, 70 had visited the emergency department during their enrollment for a total of 118 unique visits. The regression analysis demonstrated a decreasing number of emergency department visits over time for the low ($P = 0.0633$) and mid ($P = 0.0450$) self-efficacy groups but not for the high self-efficacy group ($P = 0.1155$). Pain (22.9%), urinary retention (18.6%), and fever (5.9%) were the most common reasons for emergency department visits.

Conclusions: Patients with low and mid self-efficacy had a decreasing number of emergency department usage over time. Those with high self-efficacy did not follow these trends. Interventions to improve communication between patients and primary treatment teams could prove beneficial in avoiding excess emergency department use.

Keywords: Self efficacy; Emergency departments; Vulnerable populations; Health services accessibility; Prostate cancer

1. Introduction

Self-efficacy, or the confidence in one's ability to carry out appropriate actions to reach goals, has long been viewed as a potential avenue for achieving positive health outcomes [1]. One aspect of self-efficacy in health care focuses on the perceived ability of a patient to interact and communicate successfully with his or her physicians to achieve health care goals; it predicts health behavior and health maintenance [2,3]. Further, there is evidence in oncology of relationships between self-efficacy, increased treatment adherence, improved measures of health-related quality of life, better self-maintenance behaviors, and fewer social and psychological symptoms [4–6].

Although self-efficacy is known to be related to positive health outcomes, its relationship with usage of health services remains sparsely studied. We administer a statewide program that provides free prostate cancer care to low-income, underinsured, and uninsured men, whom we seek to empower to navigate the health care system and avoid unnecessary services, such as the inappropriate use of the emergency department. Our goal in this study was to examine the relationship between self-efficacy and emergency department visits in this population of underserved men. We hypothesized that those with greater self-efficacy

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would avoid the emergency department because they would be more successful at advocating for themselves in primary care settings.

2. Methods

We prospectively analyzed data from men enrolled in the University of California, Los Angeles Men's Health Study (MHS). Men enrolled in this study are drawn from a state-funded program called *Improving Access, Counseling, and Treatment for Californians with Prostate Cancer (IMPACT)* that provides free medical services to low-income, uninsured, and underinsured California residents with prostate cancer. Low-income patients are defined as those with a household income $<200\%$ of the Federal poverty level. Once enrolled in the program, each patient is assigned a nurse case manager (NCM), who works over the course of program enrollment to empower participants through the enhancement of self-efficacy in patient-provider interactions [7]. Clinical coordinators in the IMPACT program work to assist the NCM with follow-up and logistics in relation to care. On IMPACT enrollment, men were invited to participate in the MHS. Informed consent was obtained. Receipt of IMPACT benefits was not contingent on research participation. All study protocols were approved by the University of California, Los Angeles Office for the Protection of Research Subjects and were compliant with the Health Insurance Portability and Accountability Act.

MHS data collection initially included telephone interviews in English or Spanish by trained, language-matched interviewers, followed by self-administered questionnaires in English or Spanish. The self-administered questionnaire was discontinued in July 2011 and its items folded into the telephone interview, which includes validated instruments to measure self-efficacy, health-related quality of life, and other patient-centered outcomes, as well as demographics and health behaviors. Participants were interviewed at baseline and every 6 months for up to 5 years. Clinical data were obtained from medical record abstraction. To procure a contemporary data set, study eligibility required patients to have enrolled in the MHS after June 2006 and to have completed the baseline self-efficacy measure. Participants received a $10 incentive for each interview and questionnaire up until 2011 when the MHS ended the compensation.

2.1. Measures

The primary outcome was emergency department usage during enrollment in the IMPACT program. Patients reported emergency department visits to their NCM during telephone follow-ups. IMPACT staff requested medical records from the emergency department visits to determine coverage eligibility for prostate cancer-related services. We abstracted details of the emergency department visits from patient medical charts (e.g., date and reason) from IMPACT enrollment until most recent follow-up date. Follow-up time is calculated from the date the patients enrolled in IMPACT to either their disenrollment from the program or the date the data set was downloaded from the program server (January 13, 2014), whichever came first.

The primary independent variable of interest was score on the validated short form of the *Perceived self-Efficacy in Patient-Physician Interactions (PEPPI)* [8]. The 5-item instrument is a reliable measure for older patients' self-efficacy in interacting with physicians by assessing subjective sense of self-confidence when interacting with physicians. Specifically, PEPPI measures patients' perceived ability to both obtain information about their health and attend to their chief medical concerns [8]. Scores can range from 5 to 25, with higher scores corresponding to greater self-efficacy. Because analysis showed no significant change in participants PEPPI scores over time, we used PEPPI scores from the baseline MHS interviews. Further, the distribution of PEPPI scores was the same for participants who were measured via the self-administered questionnaire compared with those completed solely over the telephone. The end of the $10 compensation corresponded with switch from the self-administered questionnaire to the telephone interview, indicating that PEPPI scores among the groups were not affected by this incentive.

2.2. Statistical analysis

Most covariates were stratified or dichotomized for analysis, including race/ethnicity (white non-Hispanic, Hispanic, black, and other), primary language (English vs. other), partnership status (in a committed relationship vs. not in a committed relationship), education level (college graduate, high school graduate, and less than high school graduate), annual household income (none vs. any), Charlson comorbidity index (0 vs. ≥ 0), body mass index (BMI $<$ 25, 25–29, 30–35, and >35), Gleason score (≤ 7 vs. >7), highest pretreatment prostate-specific antigen level(<4, 4–10, and >10), and primary treatment (radical prostatectomy, radiation, hormone therapy, and watchful waiting/none). Because PEPPI scores were not normally distributed and right skewed, we categorized them into tertiles as proposed by the instrument's developers, Maly et al. [9] as well as a method used in previous studies with the PEPPI measure and IMPACT data set [5].

We also calculated the monthly rate of NCM, coordinator assessments, and nonemergency department provider visits during the follow-up period to assess the full spectrum of participant interaction with the clinical services provided by IMPACT.

Covariates were compared in bivariate analyses across the 3 self-efficacy groups and by emergency department visits (any vs. none) using a Chi-square test or Fisher exact test for categorical variables and analysis of variance for continuous variables. We then conducted a multivariate

repeated measures regression analysis with a negative binomial distribution to calculate predicted emergency department visits over time stratified by the 3 PEPPI groups. The base unit for the follow-up time was 4-month intervals and emergency department rates were calculated as number of visits within each interval. Covariates with a $P = 0.20$ or less in the bivariate analysis were included in the forward selection process to construct the final multivariate model. Covariates with $P < 0.05$ were considered significant and retained in the model. All tests were 2 tailed. All statistical analyses were conducted in SAS 9.4 (Cary, NC).

3. Results

Our study sample included 469 men who had a baseline self-efficacy score. Of these, 70 (15%) had visited the emergency department during their IMPACT enrollment, for a total of 118 unique visits, ranging from 1 to 6 visits per patient. Reasons for emergency department visit included pain (22.9%), urinary retention (18.6%), catheter issues (5.9%), fever/chills (5.9%), surgical site injury/bleeding (5.1%), medication refill (5.1%), nausea/vomit (5.1%), hematuria (3.4%), edema (3.4%), chest pain (3.4%), and syncope (2.5%) (Table 1). Follow-up times ranged from 0.1 to 84.7 months, which corresponds to 21 four-month intervals. The mean (standard deviation [SD]) PEPPI score was 21.2 (4.3) with a median of 22.0 and a range of 5 to 25. The tertiles in this sample were low (<21), mid (21–24), and high (25).

Table 1
Reason for emergency department visit

Reason	Number (%)
Pain	27 (22.9)
Urinary retention	22 (18.6)
Foley catheter issues	7 (5.9)
Fever/chills	7 (5.9)
Unknown	7 (5.9)
Medication refill	6 (5.1)
Nausea/vomit	6 (5.1)
Surgical site bleed	6 (5.1)
Edema	4 (3.4)
Hematuria	4 (3.4)
Chest pain	4 (3.4)
Syncope	3 (2.5)
Bleed	3 (2.5)
Cough	2 (1.7)
Dysuria	2 (1.7)
Cellulitis	1 (0.85)
Diabetic complications	1 (0.85)
Kidney failure	1 (0.85)
Vision loss	1 (0.85)
Urosepsis	1 (0.85)
Cystostomy check	1 (0.85)
Gout complications	1 (0.85)
Trauma	1 (0.85)

Table 2 presents demographic characteristics stratified by the 3 PEPPI categories. The study population included 56% Hispanic and 19% African American patients. Those in the low- and mid-PEPPI strata were more likely to speak English as their primary language and be nonwhite non-Hispanic compared with those in the high PEPPI group ($P = 0.0002$ and $P = 0.0005$, respectively). Patients in the high PEPPI strata had a longer mean follow-up time than those in the mid and low groups ($P = 0.0257$). Patients in the low- and mid–self-efficacy groups also trended towards being less likely to be in a committed relationship ($P = 0.07$), being more educated ($P = 0.06$) and having a greater comorbidity burden ($P = 0.07$) than those with high self-efficacy. Income, BMI, Gleason sum, type of primary prostate cancer treatment and mean age at enrollment did not differ across PEPPI groups.

We also stratified the sample into those who had any emergency department visits and those who did not (Table 3). Patients with any emergency department visits had an increased follow-up time compared with those without a visit ($P = 0.0241$). Patients with a higher Gleason sum were more likely to have an emergency department visit ($P = 0.0001$). Further, patients with any visits to the emergency department were more likely to receive hormone therapy as their primary treatment ($P = 0.0001$). We found no other meaningful differences in population characteristics between these 2 groups.

NCMs and coordinators had an average of 0.67 assessments per month with a SD = 0.62 (range: 0–4.21). There was no significant difference in amount of NCM interaction by PEPPI strata ($P = 0.1606$). Similarly, we calculated a monthly rate of nonemergency department provider visits. Patients had an average of 0.67 visits per month with a SD = 0.63 (range: 0–67). There was no difference by PEPPI strata ($P = 0.1646$), but there was a difference by likelihood of emergency department usage such that those who visited the emergency department at any time during the follow-up period had more nonemergency department physician encounters ($P < 0.0001$).

We included several covariates in our multivariate model: race/ethnicity, primary language, partnership status, education level attained, income, comorbidity, BMI, Gleason score, highest pretreatment prostate-specific antigen level, primary treatment modality, and months from IMPACT enrollment to MHS enrollment. The regression analysis resulted in a final model that only included Gleason score as a covariate and showed that those in the low and mid PEPPI categories had *decreasing* rates of emergency department visits over time ($P = 0.0633$ and $P = 0.0450$, respectively; Fig.). The usage rates were 0.92 and 0.91 visits per 4-month period for the low and mid PEPPI categories, respectively. Contrary to our hypothesis, men in the high PEPPI category trended toward *increasing* rates of emergency department visits over time ($P = 0.12$). The emergency department usage rate for the high PEPPI

Table 2
Baseline study population demographic characteristics by perceived self-efficacy in patient-physician interaction (PEPPI)

	Total	High PEPPI (25)	Mid PEPPI (21–24)	Low PEPPI (<21)	*P* value
Number of patients	469	170	129	170	
Mean ± SD/median age at enrollment, y		60.3 ± 5.8/60.5	59.5 ± 5.7/60.1	59.4 ± 5.1/59.9	0.2636
Race/ethnicity, number (%)					
White non-Hispanic	79 (16.8)	19 (11.1)	19 (14.7)	41 (24.1)	0.0005
Hispanic	263 (56.1)	116 (68.2)	74 (57.4)	75 (42.9)	
Black	87 (18.6)	26 (15.3)	24 (18.6)	37 (21.8)	
Other	40 (8.5)	9 (5.3)	12 (9.3)	17 (11.2)	
Primary language, number (%)					
English	224 (47.7)	61 (35.9)	64 (49.6)	99 (58.2)	0.0002
Nonenglish	245 (52.2)	109 (64.1)	65 (50.4)	71 (41.8)	
Partnership status, number (%)					
Committed relationship	318 (68.1)	127 (74.7)	84 (65.1)	107 (63.7)	0.0657
Non–committed relationship	149 (31.9)	43 (25.3)	45 (34.9)	61 (36.3)	
Education level, number (%)					
College graduate	66 (14.1)	17 (10.0)	24 (18.6)	25 (14.7)	0.0609
High school graduate	196 (41.8)	65 (38.2)	52 (40.3)	79 (46.5)	
<High school graduate	207 (44.1)	88 (51.8)	53 (40.1)	66 (38.8)	
Income, number (%)					
>0$	361 (77.5)	132 (78.6)	101 (78.9)	128 (75.3)	0.6945
0$	105 (22.5)	36 (21.4)	27 (21.1)	42 (24.7)	
Charlson index comorbidity conditions, number (%)					
0	285 (63.2)	114 (69.9)	74 (61.7)	97 (57.7)	0.0653
1 or greater	166 (36.8)	49 (30.1)	46 (38.3)	71 (42.3)	
BMI (kg/m^2), number (%)					
<25	103 (23.0)	32 (19.9)	34 (38.8)	37 (22.6)	0.5739
25–29	206 (46.5)	79 (49.1)	47 (39.8)	80 (48.8)	
30–35	95 (21.4)	35 (21.7)	28 (23.7)	32 (19.5)	
>35	39 (8.9)	15 (21.6)	9 (7.6)	15 (9.2)	
Gleason score, number (%)					
≤7	343 (74.6)	131 (78.4)	87 (68.5)	125 (75.3)	0.1472
>7	117 (25.4)	36 (21.6)	40 (31.5)	41 (24.7)	
Primary treatment, number (%)					
Hormone	66 (14.9)	17 (10.4)	24 (20.7)	25 (15.2)	0.095
Radical Prostatectomy	202 (45.6)	86 (52.8)	48 (41.4)	68 (41.5)	
Radiation	149 (33.6)	54 (33.1)	35 (30.2)	60 (36.6)	
Watchful waiting	26 (5.9)	6 (3.7)	9 (7.8)	11 (6.7)	
Time NCM intake to MHS (%)					
Within 1 mo	315 (69.7)	115 (70.1)	78 (65.0)	122 (72.6)	0.6305
Within 2 mo	50 (11.1)	15 (9.2)	19 (15.8)	16 (9.5)	
Within 3 mo	31 (6.8)	12 (7.3)	8 (6.7)	11 (6.6)	
≥3 mo	56 (12.3)	22 (13.4)	15 (12.5)	19 (11.3)	
Months of follow-up					
Mean ± SD	18.5 ± 14.2	20.86 ± 14.81	17.07 ± 14.24	17.25 ± 13.26	0.0257
Median (range)	12.9 (0.1–84.7)	16.8 (0.69–71.05)	11.9 (0.09–71.84)	12.1 (0.46–84.6)	
ER visits, number (%)					
0	399	143 (84.1)	111 (86.1)	145 (85.3)	0.8444
1	43	19 (11.2)	10 (7.8)	14 (8.2)	
2	16	5 (2.9)	4 (3.1)	7 (4.2)	
3	6	2 (1.2)	2 (1.6)	2 (1.2)	
4	2	0 (0.0)	0 (0.0)	2 (1.2)	
5	1	0 (0.0)	1 (0.8)	0 (0.0)	
6	2	1 (0.6)	1 (0.8)	0 (0.0)	

Table 3
Baseline study population demographic characteristics by emergency department (ED) visit

	Patients with 0 ED visits	Patients with ≥1 ED visit	*P* value
Number of patients	399	70	
Mean ± SD/median age at enrollment, y	59.5 ± 5.3/59.8	60.9 ± 6.5/61.6	0.0796
Mean ± SD/median PEPPI	21.2 ± 4.3/ 23.0	21.1 ± 4.6/22.0	
PEPPI category			0.8936
High PEPPI (25)	143 (84.1)	27 (15.9)	
Mid PEPPI (21–24)	111 (86.1)	18 (13.9)	
Low PEPPI (<21)	145 (85.3)	25 (14.7)	
Race/ethnicity, number (%)			
White non-Hispanic	65 (16.3)	14 (20.0)	0.8169
Hispanic	226 (56.6)	37 (52.9)	
Black	75 (18.8)	12 (17.1)	
Other	33 (8.3)	7 (10.0)	
Primary language, number (%)			
English	190 (47.6)	34 (48.6)	0.883
Nonenglish	209 (52.4)	36 (51.4)	
Partnership status, number (%)			
Committed relationship	273 (68.8)	45 (64.3)	0.4584
Non–committed relationship	124 (31.2)	25 (35.7)	
Education level, number (%)			
College graduate	56 (14.0)	10 (14.3)	0.9222
High school graduate	168 (42.1)	28 (40.0)	
<High school graduate	175 (43.9)	32 (45.7)	
Income, number (%)			
>0$	311 (78.3)	50 (72.5)	0.2811
0$	86 (21.7)	19 (27.5)	
Charlson index comorbidity conditions, number (%)			
0	246 (64.4)	39 (56.6)	0.7629
1 or greater	136 (35.6)	30 (43.5)	
BMI (kg/m^2), number (%)			
<25	84 (22.5)	19 (27.5)	0.675
25–29	175 (46.8)	31 (44.9)	
30–35	80 (21.4)	15 (21.7)	
>35	35 (9.4)	4 (5.8)	
Gleason score, number (%)			
≤7	305 (77.8)	38 (55.9)	0.0001
>7	87 (22.2)	30 (44.1)	
Primary treatment, number (%)			
Hormone	46 (12.3)	20 (28.6)	0.0001
Radical prostatectomy	174 (46.7)	38 (40.0	
Radiation	127 (34.1)	22 (31.4)	
Watchful waiting	26 (7.0)	0 (0.0)	
Time, NCM intake to MHS (%)			
Within 1 mo	265 (69.2)	50 (72.5)	0.5159
Within 2 mo	41 (10.7)	9 (13.0)	
Within 3 mo	29 (7.6)	2 (2.9)	
≥3 mo	48 (12.5)	8 (11.6)	

category is 1.06 visits per 4-month period. Of note, we also tested a model using a variable to denote progression to metastatic disease before or during IMPACT enrollment, but this did not change the results of the multivariate model.

4. Discussion

In this study investigating the relationship between self-efficacy and emergency department usage in low-income uninsured men with prostate cancer, we report 2 principal

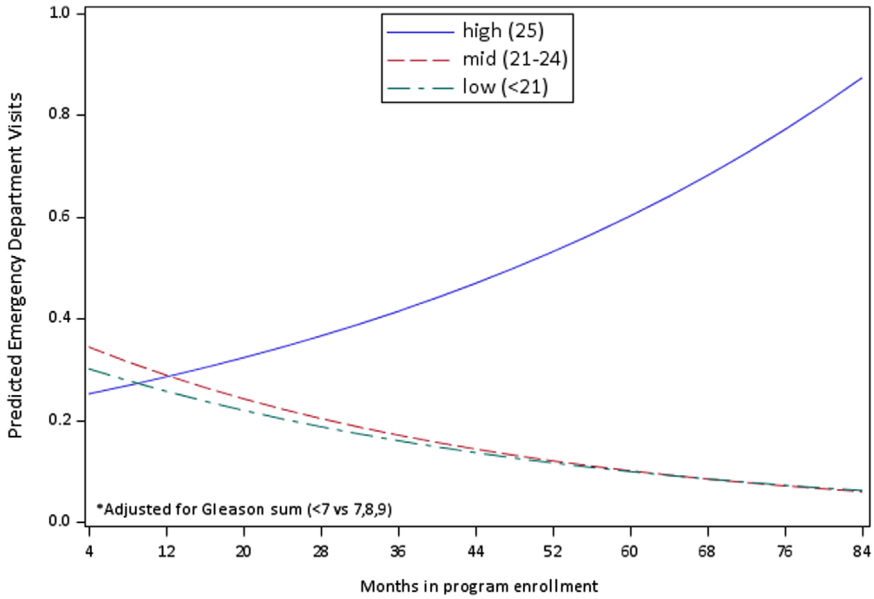

Fig. Predicted emergency department counts by self-efficacy category. (Color version of figure is available online.)

findings. First, men with low and moderate self-efficacy had decreasing rates of emergency department visits over time, whereas those with high self-efficacy did not show this pattern. For many men enrolled in IMPACT, this program marks the beginning of their formal engagement with the health care system [10]. One plausible explanation for the difference in rate of emergency department visits between the high self-efficacy group and the lower strata may lie in safety-net services as primary sources of care. NCMs instructed patients that IMPACT would only cover emergency department visits directly related to their prostate cancer health care concerns. However, an individual with high self-efficacy, who feels very confident in communicating with his physician, may continue to use the emergency department because that has been his usual source of care, and he feels his concerns and health care issues are being adequately addressed there. Men with low or moderate self-efficacy, however, may use the emergency department less often because they never felt their health care needs were met in this setting. Of note, there was no difference in PEPPI by the intensity of IMPACT usage as measured by the rates of NCM and program coordinator interactions and nonemergency department visits. This suggests that all the self-efficacy groups were using resources at similar rates.

It is also possible that involvement in the IMPACT program, which includes NCMs providing materials and advice meant to empower patients, may affect the self-efficacy strata differently. Men with high self-efficacy may be less willing to listen and change approaches to health care than men with lower self-efficacy. For example, 1 participant with a maximum self-efficacy score of 25 visited the emergency department 6 separate times without an urgent complaint but rather to fill prescriptions. He reported being "very satisfied" with his care and "grateful for the IMPACT program." Despite IMPACT staff providing clear instructions that these visits would not be reimbursed, he continued to use the emergency department in this manner. Conversely, participants with lower self-efficacy may have been more amenable to advice from the NCM and thus avoided inappropriate emergency department usage.

Our second principal finding is that pain and urinary retention were the primary complaints for visits to the emergency department. These reasons for visit were comparable to rates found in a large study of patients with prostate cancer, which found pain (34.8%), respiratory (12.0%), trauma (9.6%), and bleeding (9.2%) as the main chief complaints [11].

Our results are consistent with a recent article by Taubman et al. [12], who studied the expansion of Medicaid in Oregon. In that study, patients randomized to Medicaid coverage used the emergency department significantly more than patients without insurance, despite encouragement to visit primary sources of care. The authors hypothesized that Medicaid did not decrease emergency department use partially because it did not increase access to and use of primary care. Additionally, under the Affordable Care Act, many previously uninsured are now able to visit the emergency department without a copay. These findings, along with those reported in our study, underscore the importance of advocating for proper use of primary care to prevent emergency department visits, especially among newly insured individuals. We experienced an increase in emergency department use among high self-efficacy IMPACT patients—patients who have faith in their ability to navigate the health care system.

Raven et al. [13] found that 88.7% of all emergency department visits that are retrospectively determined to be nonemergency cannot be distinguished from true

emergencies from the chief complaint alone. This is a challenge also faced by the IMPACT program. Friedman et al. emphasized the use of a "medical home" as a method to decrease emergency department visits through specific case management, extended hours and walk in visits. One of the goals of the IMPACT program is to aid patients who had previously not been in a formalized health care program by giving them the tools and knowledge to navigate it successfully.

The findings of our study have potential policy implications for underserved patients. Although previous investigations of this population have shown a positive association between self-efficacy and health-related quality of life, potential avenues remain for optimizing health care administration [5]. For men enrolled in IMPACT, those with high self-efficacy might benefit from additional intervention to ensure that primary prostate cancer care providers are used as the main resource for care, whereas patients with lower self-efficacy might receive additional counseling to enhance empowerment and ensure confidence in visiting the emergency department at times of actual need.

Organizations providing health care services to indigent patients should consider measuring self-efficacy at entry to treatment programs as a way to guide both health care and patient education. McBride et al. [14] have described the "teachable moment" as naturally occurring life transitions or health events that are thought to be motivational in providing impetus for change in behavior and health patterns. Further research to identify appropriate teachable moments in relation to proper health care usage for patients enrolled in similar programs could result in improved patient health outcomes and decreased costs.

Our findings must be considered in the context of our study limitations. The PEPPI measure, although validated, was originally developed among older adults; thus, its psychometric properties in low-income, uninsured men with prostate cancer are not fully understood [8]. However, PEPPI has been used in prior analyses of men with prostate cancer [5,15]. Further, we may have missed some emergency department visits as records were dependent on self-report by IMPACT participants. However, we believe that the potential for recall bias (e.g., patients with a low PEPPI being less likely to report a visit) is low. Patients are motivated to report the visits to the IMPACT program so they are not financially liable for the emergency department visit. In addition, most patients do not go a long time without speaking to a NCM, who would ascertain any recent hospital visits and check on the patient's status. Finally, the uniqueness of the IMPACT population may limit the generalizability of our results to other populations. In our cohort, 14.9% of prostate cancer patients have an emergency department visit over an average follow-up time of 18.5 months. Taubman et al. estimated that 34.5% of individuals below the federal poverty level visited the emergency department during the 18-month study period. The fact that patients are put in a program that offers a primary source of care may have affected overall emergency department use.

5. Conclusion

Despite these limitations, our analysis offers a new perspective into self-efficacy in patient-physician interaction and health care usage among indigent men with prostate cancer. In underserved men with prostate cancer, we have shown that repeated visits to the emergency department for routine care may have the potential to be avoided with specifically directed interventions for patients with different self-efficacy.

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