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Patient and Partner Reported Sexual Satisfaction After Definitive Therapy for Organ-Confined Prostate Cancer

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Patient and Partner Reported Sexual Satisfaction After Definitive Therapy for Organ-Confined Prostate Cancer

By

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M.D., Brown University, 2006

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An abstract of
a thesis submitted to the Faculty of the
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Abstract

Patient and Partner Reported Sexual Satisfaction After Definitive Therapy for Organ-Confined Prostate Cancer
By Akanksha Mehta

Introduction: Erectile dysfunction (ED) is the most common health-related quality of life complaint among prostate cancer survivors and their partners. The goal of this analysis was to identify predictors of patient- and partner-reported sexual satisfaction, and to evaluate concordance of sexual satisfaction between patients and partners two years after prostatectomy.

Methods: This cross-sectional analysis included men with organ confined prostate cancer, and without baseline ED, and their partners. Clinical and demographic characteristics were collected for all participants. Sexual satisfaction (five possible levels) was gauged by responses to the sexual domain of the EPIC-26 questionnaire, completed by study participants at baseline and 24-months post-operatively. The association between sexual satisfaction and patient and partner age, age difference, baseline EPIC sexual domain score, nerve sparing status, and post-operative use of erectile aids, was evaluated in multivariate logistic regression models. Patient and partner reported sexual satisfaction scores were categorized as two-level and five-level responses, and compared using weighted and unweighted kappa statistics. Differences in predictors of sexual satisfaction among concordant and discordant patient and partner pairs were evaluated using Chi-square and Fisher's exact tests. Statistical significance was defined as $p<0.05$.

Results: High EPIC sexual domain score (OR 2.68, 95%CI 1.41-5.10) and lack of use of erectile aids (OR 2.06, 95%CI 1.05-4.03), were significantly associated with patient sexual satisfaction in multivariate analyses. Lack of use of erectile aids was also significantly associated with partner sexual satisfaction (OR 2.90, 95%CI 1.47-5.72). Proportional concordance between patient- and partner-reported satisfaction was 0.63 (95% CI 0.56-0.70) and 0.37 (95% CI 0.30-0.44) for the two-level and five-level responses, respectively, corresponding to simple and weighted kappa statistics of 0.26 (95% CI 0.13-0.40) and 0.29 (95%CI 0.19-0.39), respectively. High baseline EPIC domain score was the only characteristic associated with concordant sexual satisfaction among patient and partner pairs.

Conclusions: Couples with good baseline erectile function, who either do not need, or do not wish to use erectile aids two years after prostatectomy, are most likely to report sexual satisfaction in the post-prostatectomy period. Good baseline sexual function is also a predictor of concordant sexual satisfaction among prostate cancer survivors and their partners.

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INTRODUCTION

Prostate cancer is the second most common malignancy among American men, and the second leading cause of cancer-related death. The American Cancer Society estimates that 1 out of every 7 men is diagnosed with prostate cancer during his lifetime, and that 1 in 38 men dies of the disease. Early detection, combined with advances in treatment, has dramatically improved the survival of men diagnosed with organ-confined prostate cancer; the 5-year relative survival rate is 100% (1).

More than 2.9 million prostate cancer patients are currently alive in the United States. Many survivors experience long-term effects of disease treatment, including urinary incontinence, sexual dysfunction, bowel issues, and adverse psychosocial and relationship effects (1). However, research addressing prostate cancer survivorship, in general, remains sparse (2).

Erectile dysfunction (ED) is the most common health-related quality of life complaint following treatment for prostate cancer (3). The estimated prevalence of ED among men who received radical prostatectomy (RP) varies between 50% and 80%, depending on how ED is defined, when in the post-operative period it is measured, and how successfully it is treated (3-5).

Male erectile physiology involves generation of nerve impulses from the brain to the penis following sexual stimulation, release of nitric oxide from cavernosal nerve endings, vasodilation of penile arteries, and increased blood flow into the corpora cavernosa, resulting in tumescence (6). Disruption of this sequence of events due to factors related or unrelated to surgery, such as intra-operative injury to the cavernosal nerves, impaired penile artery vasodilation due to age-related atherosclerosis, or inability

to maintain tumescence due to fibrosis of corporal cavernosal tissues, all contribute to ED at various time points in the post-prostatectomy period (7).

Prevention of post-prostatectomy ED has centered on the development of a nerve-sparing surgical approach that preserves the cavernosal nerves surrounding the prostate gland, with the aim of maintaining normal erectile physiology. Organ-confined prostate cancer is particularly amenable to a nerve-sparing approach, as the likelihood of cancer being present at the margins of the prostate is low, and wide surgical resection can be obviated without compromising cancer control. However, even a nerve-sparing surgical approach involves some degree of manipulation of the cavernosal nerves, leading to temporary neuropraxia and consequent ED in the early post-prostatectomy period. Neuropraxia may last 12-24 months after prostatectomy.

Nerve-sparing surgery is one, but not the only, factor associated with recovery of erectile function following prostatectomy. Additional factors found to be predictive of recovery of erectile function include age at prostatectomy, baseline medical comorbidities, baseline erectile function, and the use of erectile function aids for penile rehabilitation in the post-prostatectomy period (8). Distinct from erectile function is the concept of sexual satisfaction, which is not as well studied. Sexual satisfaction more broadly encompasses the various components of sexual function, such as libido, orgasm, and erection quality, as well as physical intimacy, and other aspects of the patient-partner relationship. As such, although erectile function is likely to be a predictor of sexual satisfaction, it is not the only determinant (9, 10).

The aim of this analysis was two-fold: first, to identify the predictors of patient sexual satisfaction and partner sexual satisfaction two years after radical prostatectomy

for organ-confined prostate cancer, and second, to estimate the distribution of concordance/discordance between patient and partner-reported sexual satisfaction two years after definitive therapy for organ-confined prostate cancer.

BACKGROUND

Erectile dysfunction has meaningful biological, psychological, and social effects on the quality of life of affected individuals and their sexual partners. Untreated ED can cause frustration, anxiety, and depression for both patients and partners, potentially culminating in separation and/or divorce (11-13). Prostate cancer survivors, who develop varying degrees of erectile dysfunction as a result of their treatment, are especially at risk for these undesirable outcomes.

The goal of treatment of ED is achievement of a satisfactory sex life for couples engaged sexual relationships. Understanding the predictors of sexual satisfaction for both patients and partners is essential for achieving this overall goal. Demographic factors, such as age, clinical factors, such as overall health, relationship and psychological factors, as well as sexual function, have all shown to be critical predictors of sexual and relationship satisfaction in the general population (14). The relative importance of these factors has not been investigated in prostate cancer survivors and their partners.

A growing body of literature supports the use of sexual partner-engaged approaches to assist ED treatment and rehabilitation (15). Partner involvement in the evaluation and treatment of ED results in increased adherence to ED rehabilitation and treatment, improved sexual function, and better relationship satisfaction for both the patient and the partner (15). Furthermore, patients' and partners' sexual function are correlated (16); In a study by Jiann et al, women whose partners were affected by ED scored lower on the Female Sexual Function Index than women whose partners did not have ED. Thus, it is likely that a failure to address female sexual function and sexual satisfaction ultimately leads to a failure in adequately treating the male patient.

That said, the sexual history, goals, and expectations of the female partner are often overlooked. Discussion of sexual function is not a comfortable topic for patients, partners, and physicians alike. Physician gender has been shown to independently impact the frequency with which a sexual history is obtained from the female partner of a patient with erectile dysfunction, as well as how detailed that history is (17). As a result, much of the published literature discussing the etiology, prevalence, and treatment of ED excludes the female partner altogether.

It is evident that partners play a critical role in the sexual recovery of prostate cancer survivors by providing both emotional and logistical support (18). Partners' sexual interest has been shown to be important for patients' recovery of sexual function (19). Additionally, partners' level of depression is predictive of the patient's relationship satisfaction, sexual satisfaction, and perceived quality of communication (20). However, our understanding of the partner's role with respect to survivorship care remains incomplete. There are still gaps in our knowledge about how important erectile function and sexual recovery are to partners, what the determinants of sexual satisfaction among partners are, and how sexual satisfaction correlates between patients and their partners following treatment for prostate cancer.

Since health-related quality of life outcomes vary considerably with respect to the type of treatment provided for prostate cancer, answers to the above questions may vary as well. This analysis focuses on sexual satisfaction among patients and partners following radical prostatectomy.

METHODS

Research goal

The goal of the present analysis was to identify the predictors of patient sexual satisfaction and partner sexual satisfaction, and evaluate concordance or discordance of sexual satisfaction among patient and partner pairs two years after radical prostatectomy for organ-confined prostate cancer.

We hypothesized that patient- and partner-reported sexual satisfaction would be associated with the need for use of erectile aids in the post-prostatectomy period. We also anticipated good sexual satisfaction concordance between patient and partner pairs in our study population.

Study design

This study was a cross sectional analysis of prostate cancer patients and their partners comprising a prospective, longitudinal cohort. Patient and partners pairs were evaluated at baseline, prior to undergoing prostatectomy, and then at 24 months following radical prostatectomy for organ-confined prostate cancer.

Study Population

The Prostate Cancer Outcomes and Satisfaction With Treatment Quality Assessment **(**PROSTQA) is a multi-institution, prospective, longitudinal cohort of men with organ-confined (clinical stage T1 or T2) prostate cancer, who were treated with either radical prostatectomy or radiation therapy (3). The aim of this ongoing cohort study is to collect data on indicators of health-related quality of life (HRQOL) including sexual, urinary and bowel function. Patient enrollment occurred from 2003 to 2006 at nine academic centers in the United States (Beth Israel Deaconess Medical Center,

Brigham and Women's Hospital, Cleveland Clinic, John Hopkins University, University of Michigan, Vanderbilt University, Washington University in St. Louis, Michigan State University, and University of California San Francisco).

All men with organ-confined prostate cancer, who were able and willing to provide informed consent, and who had not previously undergone any treatment for prostate cancer, were invited for inclusion in the cohort. Partners who were able and willing to provide informed consent were also invited. Partner enrollment was contingent on patient enrollment, but not vice versa.

The analytical cohort for the present analysis consisted of all patient and partner pairs who had completed the baseline questionnaires, undergone radical prostatectomy, and completed follow-up questionnaires 24 months following radical prostatectomy. Patients who reported baseline erectile dysfunction were excluded (Figure 1). This analysis focused on the 24-month or two-year time point after radical prostatectomy because resolution of cavernosal nerve neuropraxia, and maximal recovery of baseline sexual function, can be assumed by this time. The analysis was confined to patients undergoing prostatectomy, because the timing of ED onset, and the subsequent recovery of sexual function after radiation therapy are comparatively variable and prolonged.

Measurements

Patient demographics, baseline sexual HRQOL, pre-treatment prostate specific antigen (PSA) level, and clinical data were collected through clinical visits and review of the medical record by research coordinators during the baseline visit. The Expanded Prostate Cancer Index Composite (EPIC-26) questionnaire was used to record pre-treatment function (see Appendix A1). This validated 26-item questionnaire assesses 5

HRQOL domain symptoms: urinary incontinence, urinary irritation/obstruction, sexual function, bowel function, and hormonal function. Post-treatment third-party telephone interviews at 2, 6, 12, 18, and 24 months, and yearly thereafter, recorded use and effectiveness of erectile aids.

Age and race information was available for all patients and their partners. In addition, data on each patient included education level, number of medical comorbidities, body mass index, nerve sparing surgery status, use of erectile aids in the post-prostatectomy period, and baseline EPIC sexual domain score. Education level was considered a proxy for socioeconomic status. Number of medical comorbidities and body mass index were considered indicators of overall patient health, as well as independent risk factors for erectile dysfunction. The baseline EPIC sexual domain score was considered representative of overall baseline sexual function.

Use of erectile aids in the post-operative period was the primary modifiable exposure of interest. Additional covariates included patient age, partner age, patient and partner age difference, baseline EPIC sexual domain score, and nerve sparing status. The primary outcome variables were patient- and partner-reported sexual satisfaction. Sexual satisfaction was evaluated using Q.12 from the EPIC sexual function domain, “Overall, how big a problem has your sexual function or lack of sexual function been for you during the last 4 weeks?”. Possible responses to this question are: “No problem”, “Very small problem”, “Small problem”, “Moderate problem”, and “Big problem”, which are assigned a numerical code ranging from 1-5, respectively (Appendix A1). Sexual satisfaction was categorized as no or very small problem, (1-2), while sexual dissatisfaction was categorized as a small, moderate or big problem (3-5).

Missing data were rare, and affected no more than 2 patients, partners, or pairs for each of the analyses performed. As such, imputation was not performed.

Sample-size and power considerations

A formal sample size calculation was not performed, as the primary aim of this study was not hypothesis testing, but rather, to utilize the entirety of a unique cohort of patient and partner pairs in order to identify factors associated with sexual satisfaction.

Analytic Plan

i) Descriptive analyses

A descriptive analysis of the frequency of the following baseline demographic and clinical characteristics in the study population was performed: patient age, partner age, age difference (patient-partner), patient race, partner race, joint race, patient EPIC sexual domain score, college education, body mass index (BMI), and number of medical comorbidities. Age was converted to a categorical variable for this analysis. The proportion of patients who underwent nerve sparing surgery, and the proportion of patients using erectile aids in the post-operative period were also examined (Table 1).

Unpaired patient- and partner-reported sexual satisfaction scores were compiled in a histogram, in order to illustrate the variation in sexual satisfaction reported by the study participants (Figure 2).

ii) Statistical inference

Of the demographic and clinical characteristics described above, the following were evaluated in a multivariate logistic regression model of variables associated with patient sexual satisfaction: patient age, age difference, patient EPIC sexual domain score, nerve sparing status, and post-operative use of erectile aids (Table 2), and in a

multivariate logistic regression model of variables associated with partner sexual satisfaction: partner age, age difference, patient EPIC sexual domain score, nerve sparing status, and post-operative use of erectile aids (Table 3). Odds ratios resulting from this analysis were reported with 95% confidence intervals.

As described previously, patients and partners reported their sexual satisfaction as: “No problem”, “Very small problem”, “Small problem”, “Moderate problem”, and “Big problem”, which were assigned a numerical code ranging from 1-5, respectively. The five levels were condensed into two categories: sexual satisfaction (no or very small problem, 1-2), and sexual dissatisfaction (small, moderate or big problem, 3-5). The proportion of concordant patient and partner pairs, with 95% confidence intervals, was calculated for both the two-level and five-level response tables. Simple Cohen’s kappa was used to compare patient and partner responses between the condensed categories, while weighted Cohen’s kappa was used to compare patient and partner responses across all five possible response levels (Table 4). The resulting kappa statistics were interpreted in keeping with Cohen’s original description (21).

The study population was then sub-divided into sexually concordant and discordant patient and partner pairs (concordant and satisfied, concordant and dissatisfied, discordant with satisfied patients, and discordant with satisfied partners). The distribution of patient age, patient and partner age difference, EPIC sexual domain score, nerve sparing status, and post-operative use of erectile aids between the four subgroups of patient and partner pairs was evaluated using the Chi-squared test and Fischer’s exact test (nerve sparing status).

Statistical significance was defined as $p<0.05$ throughout. All analyses were carried out using SAS 9.4 (SAS Institute Inc., Cary, NC).

RESULTS

Clinical and demographic characteristics

The analytical cohort consisted of 183 patient and partner pairs (Figure 1). The clinical and demographic characteristics of the analytical cohort are summarized in Table 1. Mean patient age was 59.5 ± 6.9 years (range 38-78). Mean partner age was comparable at 55.9 ± 7.8 years (range 23-78). Eighty-four percent of patients were older than their partners. The difference in patient and partner age was less than or equal to four years in 64% of couples.

In terms of race, the analytical cohort was predominantly white, which is consistent with the PROSTQA cohort in general. Sixty-three percent of patients were college graduates. Although half the cohort was overweight, and one-quarter was obese, most patients were healthy, without many medical comorbidities.

The vast majority (79%) of patients scored in the third (Q3) or fourth (Q4) quartiles for the EPIC-26 sexual domain score, and therefore had excellent pre-operative sexual function. For the remainder of the analysis, EPIC sexual domain scores were dichotomized into Q4 versus Q1-Q3 categories. Nerve-sparing surgery was performed almost universally (93%). In the post-operative period, 62% of patients reported using oral phosphodiesterase inhibitors for the treatment of erectile function, while 34% reported no use of any treatments, and only 3% reported use of alternative treatments.

Predictors of Sexual Satisfaction

Table 2 summarizes the results of multivariate logistic regression analysis of the variables associated with patient sexual satisfaction. Patients with a baseline EPIC sexual domain score in the fourth quartile were 2.7 times more likely to report sexual

satisfaction than patients with lower EPIC sexual domain scores (OR 2.68, 95% CI 1.41-5.10). Additionally, patients not using any erectile aids were 2.1 times as likely to report sexual satisfaction as those using oral phosphodiesterase inhibitors (OR 2.06, 95% CI 1.05-3.67) (Table 2).

Table 3 summarizes the results of multivariate logistic regression analysis of the variables associated with partner sexual satisfaction. Partners were 2.9 times more likely to report sexual satisfaction when their spouses did not use any erectile aids, compared to oral phosphodiesterase inhibitors (OR 2.90, 95% CI 1.47-5.75).

Concordance Among Patient and Partners

The distribution of unpaired patient and partner scores for sexual satisfaction, ranging from1 being most satisfied to 5 being least satisfied, is illustrated in Figure 2. Responses from patients and partners spanned the range of possible scores.

The proportion of concordant responses between patient and partner reported sexual satisfaction was 0.63 (95% CI 0.56-0.70), when responses were categorized in two levels, and 0.37 (95% CI 0.30-0.44), when responses were categorized in five levels. Concordance was further assessed using a simple kappa statistic when the responses were categorized in two levels, and a weighted kappa statistic of when the responses were categorized in five levels (Table 4). The values of the simple (0.26, 95% CI 0.13-0.40) and weighted (0.29, 95% CI 0.19-0.39) kappa were comparable (Table 4).

Interestingly, Table 4(b) shows 54 patients and 75 partners, respectively, reported a satisfaction score of 1. Conversely, 43 patients and 29 partners, respectively, reported a satisfaction score of 4. Overall, these data show that partners reported greater sexual satisfaction that patients.

Predictors of Concordance

Of the 183 patient and partner pairs comprising the analytical cohort, 50 were sexually satisfied and concordant, 64 were sexually unsatisfied and concordant, 24 were discordant, with patients being more satisfied than partners, and the remaining 43 were discordant, with partners being more satisfied than patients.

Table 5 summarizes the distribution of variables associated with concordant and discordant sexual satisfaction among patient and partner pairs. Differences in the distribution of the variables were evaluated using the Chi-squared test for all variables except nerve sparing status. For the latter, the expected frequency was <5 in more than 20% of cells; making the Chi-squared test unreliable. Fisher's exact test was used instead. The distribution of the use of erectile aids was not evaluated with a statistical test, because many of the subsets for this variable contained a single patient only.

Of the variables examined, a statistically significant difference was noted in the distribution of the EPIC sexual domain scores among the four subgroups of patient and partner pairs. The proportion of pairs reporting fourth-quartile EPIC sexual domain scores was higher among sexually satisfied concordant pairs. The contrary was true of sexually dissatisfied concordant pairs, and discordant pairs where the patient was dissatisfied (Table 5).

DISCUSSION

Sexual satisfaction among prostate cancer survivors and their partners has not been well studied to date. Survivorship studies have either excluded partners completely, or included them on a much smaller scale, as in focus groups or qualitative research studies. The PROSTQA cohort is a unique prospective and longitudinal cohort of prostate cancer survivors and their partners, in which both patients and partners were specifically queried about sexual function outcomes. Therefore, the PROSTQA cohort lends itself particularly well to investigate the predictors of sexual satisfaction among prostate cancer survivors and their partners. The cohort is homogenous, consisting of primarily Caucasian, married, and heterosexual men with localized prostate cancer, which has the additional advantage of minimizing confounding.

Our results indicate that high baseline EPIC domain score and lack of use of erectile aids were the only predictors of patient-reported sexual satisfaction two year after radical prostatectomy for organ-confined prostate cancer. Among partners, lack of use of the erectile aids was the only significant predictor of sexual satisfaction. Based on a weighted Cohen's kappa statistic of 0.29, there appears to be minimal concordance between patients and partner pairs in terms of sexual satisfaction (21, 22). High baseline EPIC domain score was also the only characteristic associated with concordant sexual satisfaction among patient and partner pairs.

Maximal possible recovery of baseline erectile function is expected to occur by two years after prostatectomy. Thus, concordance between patients and partners at this point in time is likely to be affected by incomplete recovery of erectile quality. A number of studies have demonstrated that good pre-operative erectile function is predictive of

better erectile function following prostatectomy (23). Therefore, it is not surprising that high EPIC sexual domain scores were associated with both individual and joint patient and partner sexual satisfaction.

Lack of use of erectile aids, compared to the use of oral phosphodiesterase inhibitors, was also associated with sexual satisfaction. This is interesting because the use of phosphodiesterase inhibitors for the treatment of ED, both among prostate cancer survivors and well as the general population, has become so commonplace, that patients who respond to these pills in the post-prostatectomy period may not even be diagnosed with ED by some clinicians. Rather, patients considered to have post-prostatectomy ED would be those who do not respond to oral phosphodiesterase inhibitors.

Patients may decline to use erectile aids either because they have had good recovery of baseline erectile function and no longer require the use of aids to obtain satisfactory erections, or because they have decided that post-operative erection quality is not a priority for them. Indeed, couples may develop strategies for sexual intimacy without intercourse, and be sexually satisfied (24). Alternatively, men and/or their partners may become so frustrated from the lack of an adequate response to erectile aids that they decide to forego treatment altogether (15). It is impossible to know with certainty which of the above reasons is applicable to the our analytical cohort, However, the correlation between lack of use of erectile aids and sexual satisfaction, suggests that patients had some meaningful recovery of erectile function.

It is notable that patient and partner age, or age difference, were not found to be significantly associated with sexual satisfaction or with concordance among couples. One reason for this may be that the analytical cohort was relatively homogeneous in age, with

86% of patients being in the sixth or seventh decade of life, and age discrepancy being less than ten years in the vast majority of couples (84%).

Because sexual function and dysfunction can have a profound impact on the quality of life of both prostate cancer survivors and their partners, it is clinically invaluable for patients and partners to be in agreement in terms of satisfaction with sexual function. Discordance between patients and partners can be frustrating for both parties, and a challenge to address clinically. Concordance positively impacts patient and partner well-being, and helps align future treatment strategies and goals.

In this study, calculated the proportional concordance between patient- and partner-reported sexual satisfaction, and assessed the strength of this agreement using the kappa statistic. It is important to acknowledge that the satisfaction score reported by patients and partners includes some degree of subjectivity, and thus, does not necessarily measure or interpret the same, objective truth. As such, the kappa statistic may not be the optimal tool to use in studying the concordance of patient and partner sexual satisfaction scores, and the value of the kappa statistic should be interpreted with caution.

As expected, the proportion of concordant responses between patients and partners was higher when responses were categorized in two levels versus five levels (0.63 vs. 0.37), as there are more possible combinations of discordant patient and partner responses when responses are categorized in five levels. For example, a patient reporting ‘no problem’ with a partner reporting ‘very small problem’ would be a concordant pair in the two level table, but a discordant pair in the five level table. The corresponding values for the simple and weighted kappa statistic were both low at 0.26 vs. 0.29, respectively. Because of the limitations associated with the use of Cohen’s kappa in this analysis, the

proportional concordance may be a more meaningful reflection of the agreement between patients and partners in terms of sexual satisfaction. Although not perfect, this level of agreement may be acceptable in the clinical setting, if it allows for patient and partner communication, receptivity to medical treatment and sexual health counseling, and so on. Statistical agreement must be differentiated from clinical agreement, especially since the kappa statistic may be an imperfect measure of patient and partner concordance.

This analysis has several limitations. First, the cross sectional study design does not allow for temporality to be established. With respect to the question on the use of erectile aids, for example, it was not possible to differentiate between the use of an aid at any time in the post-prostatectomy period, versus ongoing use at the time of the 24-month follow-up. Second, the number of patients and partner pairs in the analytical cohort was considerably lower than in the baseline cohort, due to participant attrition over time, as well as the exclusion of patients who reported erectile dysfunction at baseline. As a result, statistical significance may not have been reached with respect to some of the variables of interest, such as the difference in patient and partner ages. Third, it is possible that we did not use the most appropriate or most comprehensive survey instrument for the assessment of sexual satisfaction, especially among partners. Since this is a relatively new area of research, the best tools for partners may not have been developed as yet. And fourth, as previously mentioned, the cohort was homogeneous, which is a limitation in terms of the generalizability of these results, particularly among African American men, in whom the incidence of prostate cancer is substantially higher compared to Caucasian men.

Nevertheless, this study is one of a few to explore partner perspectives in prostate cancer survivorship and quality of life with respect to sexual function. These results are being used to inform the development of an interactive educational and psychological support tool for patients and partners, to specifically address challenges in the recovery of sexual function following prostatectomy.

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TABLES

Table 1: Descriptive analysis of patient and partner characteristics

Variable*	**Level**	**N (%)**
Patient Age	<50	12 (7)
	50-59	81 (44)
	60-69	77 (42)
	70-79	13 (7)
Partner age	<50	37 (20)
	50-59	94 (51)
	60-69	48(26)
	70-79	4 (2)
Age Difference (Patient-Partner)	<0	28 (16)
	0-3	69 (38)
	4-10	67 (37)
	>10	16 (9)
Patient race	White	163 (95)
	Black	6 (4)
	Other	2 (1)
Partner race	White	168 (92)
	Black	6 (3)
	Other	9 (5)
Joint race	Same	167 (92)
	Different	16 (9)
Expanded Prostate Cancer Index Composite (EPIC) sexual domain**	(0-54) Q1	13 (7)
	(54-79) Q2	26 (14)
	(79-91) Q3	51 (28)
	(91-100) Q4	93 (51)
College grad	Yes	115 (63)
	No	68 (37)
Body mass index (BMI)	<25	44 (24)
	25-30	91 (50)
	30-35	40 (22)
	>35	8 (4)
No. comorbidities	0	104 (57)
	1	60 (33)
	2	19 (11)
Nerve sparing	Yes	171 (93)
	No	12 (7)
ED Aids	None	63 (34)
	Pills	114 (62)
	Others	6 (3)

*All variables except nerve sparing surgery status and ED aids reflect baseline characteristics
** Q1-4 refers to quartiles 1-4

Table 2: Multivariate analysis of variables associated with patient sexual satisfaction

Covariate	Level	N	Adjusted OR (95% CI)	P-value
Patient age (years)	<65	142	0.93 (0.42-2.06)	0.855
	>=65	40	1.0 (reference)	
Age difference (Patient-Partner)	<0	28	1.69 (0.65-4.42)	0.282
	0-4	89	1.27 (0.63-2.56)	0.508
	4-10	64	1.0 (reference)	
EPIC sexual domain	Q4	93	2.68 (1.41-5.10)	**0.003**
	Q1-3	90	1.0 (reference)	
Nerve-sparing procedure	Yes	170	1.41 (040-4.99)	0.590
	No	12	1.0 (reference)	
Use of ED aids	None	63	2.06 (1.05-4.03)	**0.036**
	Other	6	2.15 (0.38-12.29)	0.388
	Pills Only	113	1.0 (reference)	

Table 3: Multivariate analysis of variables associated with partner sexual satisfaction

Covariate	**Level**	**N**	**Adjusted OR (95% CI)**	**P-value**
Partner age (years)	<65	155	1.18 (0.54-2.55)	0.679
	>=65	28	1.0 (reference)	
Age difference (Patient-Partner)	<0	28	1.38 (0.55-3.49)	0.491
	0-4	89	1.43 (0.72-2.81)	0.305
	4-10	64	1.0 (reference)	
EPIC sexual domain	Q4	93	1.02 (0.55-1.90)	0.946
	Q1-Q3	90	1.0 (reference)	
Nerve-sparing procedure	Yes	170	1.62 (0.47-5.64)	0.446
	No	12	1.0 (reference)	
Use of ED aids	None	63	2.90 (1.47-5.72)	**0.002**
	Other	6	2.50 (0.44-14.13)	0.301
	Pills Only	114	1.0 (reference)	

Table 4: Comparison of patient and partner satisfaction using (a) simple and (b) weighted Cohen's kappa statistic

		Sexual Satisfaction (Partner)		
Sexual Satisfaction (Patient)		Satisfied	Unsatisfied	Total
	Satisfied	50	24	74
	Unsatisfied	43	64	108
	Total	93	88	181

*Satisfied = no problem or very small problem. Unsatisfied = small, moderate, or large problem

(a) Simple kappa: 0.26 (95% CI 0.13-0.40)

		Sexual Satisfaction (Partner)					
Sexual Satisfaction (Patient)		1	2	3	4	5	Total
	1	33	3	9	5	4	54
	2	9	5	4	2	0	20
	3	12	4	4	3	6	29
	4	15	2	5	10	11	43
	5	6	4	2	9	14	36
	Total	75	18	24	29	35	181

* 1 = no problem, 2 = very small problem, 3 = small problem, 4 = moderate problem, 5 = big problem

(b) Weighted kappa: 0.29 (95% CI 0.19-0.39)

Table 5: Variables associated with concordant and discordant sexual satisfaction among patient and partner pairs*

Covariate	Level	N	Patient and partner satisfied (N=50)	Patient satisfied, partner dissatisfied (N=24)	Patient dissatisfied, partner satisfied (N=43)	Patient and partner dissatisfied (N=64)	X^2 statistic	df	p-value
Patient age (years)	<65	142	38 (27)	21 (15)	36 (25)	47 (33)	2.999	3	0.392
	≥65	40	12 (30)	3 (8)	7 (18)	17 (43)			
Age difference (Patient-Partner)	<0	28	7 (25)	6 (21)	8 (29)	7 (25)	4.322	6	0.633
	0-4	89	27 (30)	11 (12)	21 (24)	30 (34)			
	4-10	64	16 (25)	7 (11)	14 (22)	27 (42)			
EPIC sexual domain	Q4	93	34 (37)	14 (15)	15 (16)	29 (31)	**11.593**	**3**	**0.009**
	Q1-Q3	90	16 (18)	10 (11)	28 (31)	35 (39)			
Nerve-sparing procedure**	Yes	170	48 (28)	21 (12)	39 (23)	61 (36)	-	-	0.397
	No	12	2 (17)	3 (25)	4 (33)	3 (25)			
Use of ED aids***	None	63	25 (40)	7 (11)	16 (25)	14 (22)	-	-	-
	Other	6	2 (33)	1 (17)	2 (33)	1 (17)			
	Pills	114	23 (20)	16 (14)	25 (22)	49 (43)			

* Numbers in parentheses reflect row percentages

** Using Fischer's exact test (expected frequency was <5 in more than 20% of cells)

*** Statistical analysis not performed

FIGURES

Figure 1: Analytical cohort of patient and partner pairs

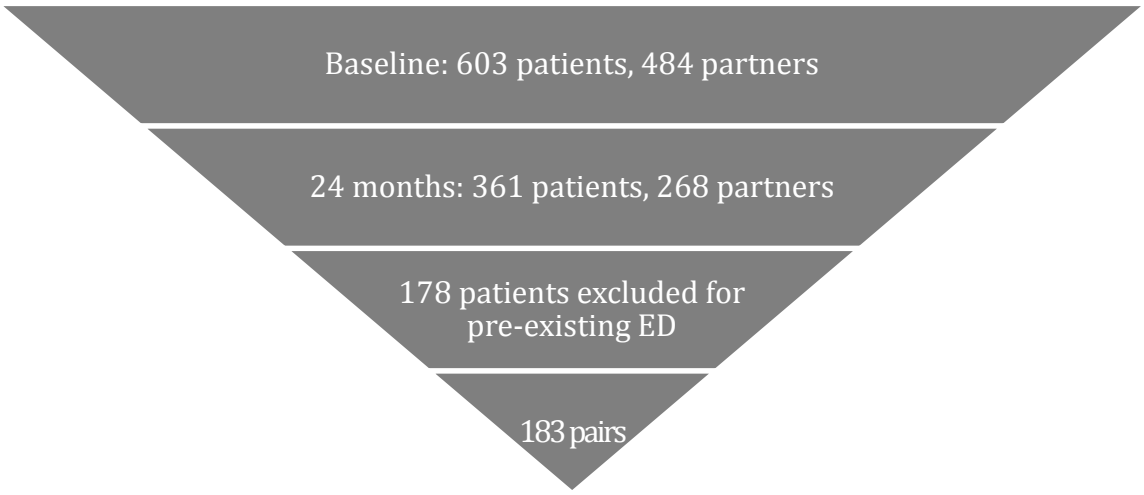
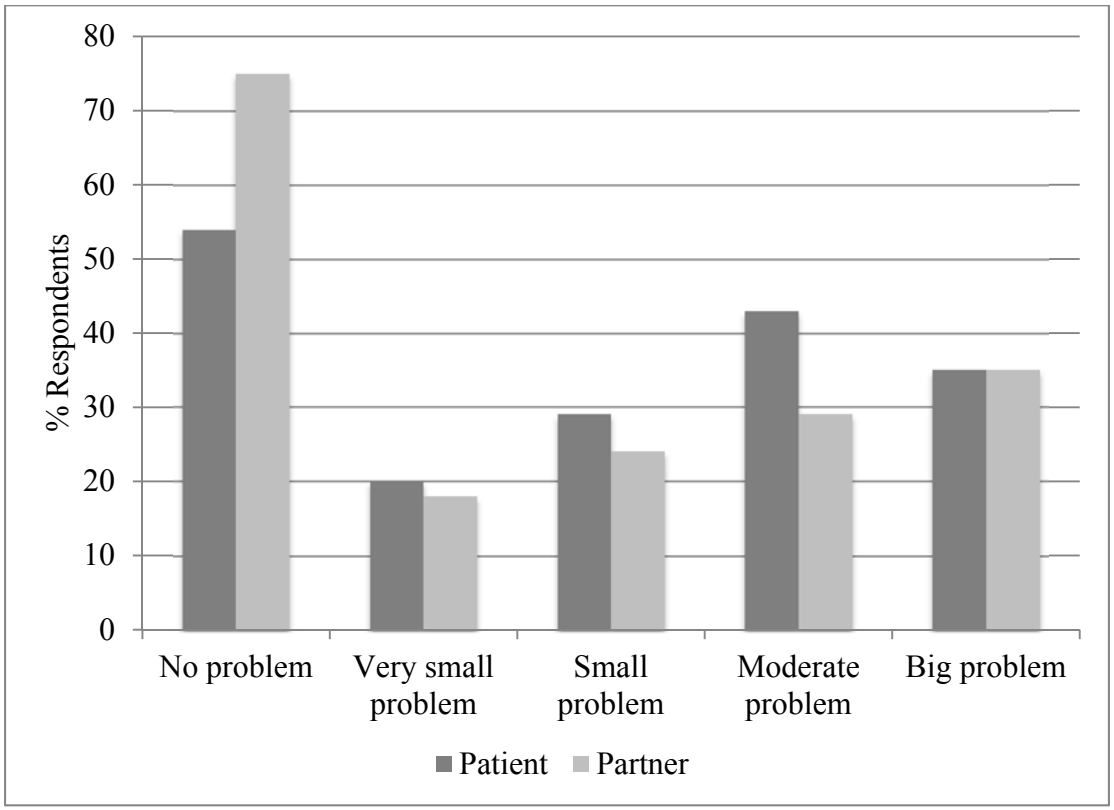


Figure 2: Distribution of patient- and partner-reported sexual satisfaction scores (unpaired)



APPENDIX

EPIC-26

The Expanded Prostate Cancer Index Composite

Short Form

This questionnaire is designed to measure Quality of Life issues in patients with Prostate cancer. To help us get the most accurate measurement, it is important that you answer all questions honestly and completely.

Remember, as with all medical records, information contained within this survey will remain strictly confidential.

Today's Date (please enter date when survey completed): Month_____Day_____Year_____

Name (optional): _____

Date of Birth (optional): Month_____Day_____Year_____

Do Not Mark in This Space

1. Over the **past 4 weeks**, how often have you leaked urine?

   More than once a day..... 1
   About once a day..... 2
   More than once a week..... 3 (Circle one number) 23/
   About once a week.....4
   Rarely or never..... 5

2. Which of the following best describes your urinary control **during the last 4 weeks**?

   No urinary control whatsoever..... 1
   Frequent dribbling..... 2 (Circle one number) 26/
   Occasional dribbling..... 3
   Total control..... 4

3. How many pads or adult diapers <u>per day</u> did you usually use to control leakage **during the last 4 weeks**?

   None 0
   1 pad per day.....… 1
   2 pads per day..... 2 (Circle one number) 27/
   3 or more pads per day..... 3

4. How big a problem, if any, has each of the following been for you **during the last 4 weeks**?

   (Circle one number on each line)

	No <u>Problem</u>	Very Small <u>Problem</u>	Small <u>Problem</u>	Moderate <u>Problem</u>	Big <u>Problem</u>	
a. Dripping or leaking urine ….....	0	1	2	3	4	28/
b. Pain or burning on urination.....	0	1	2	3	4	29/
c. Bleeding with urination.....	0	1	2	3	4	30/
d. Weak urine stream or incomplete emptying.....	0	1	2	3	4	31/
e. Need to urinate frequently during the day.....	0	1	2	3	4	33/

5. Overall, how big a problem has your urinary function been for you **during the last 4 weeks**?

   No problem..... 1
   Very small problem..... 2
   Small problem.....3 (Circle one number) 34/
   Moderate problem..... 4
   Big problem..... 5

Do Not Mark in This Space

6. How big a problem, if any, has each of the following been for you? (Circle one number on each line)

	No Problem	Very Small Problem	Small Problem	Moderate Problem	Big Problem	
a. Urgency to have a bowel movement	0	1	2	3	4	49/
b. Increased frequency of bowel movements.....	0	1	2	3	4	50/
c. Losing control of your stools.....	0	1	2	3	4	52/
d. Bloody stools	0	1	2	3	4	53/
e. Abdominal/ Pelvic/Rectal pain...	0	1	2	3	4	54/

7. Overall, how big a problem have your bowel habits been for you **during the last 4 weeks**?

No problem..... 1
Very small problem..... 2
Small problem..... 3 (Circle one number) 55/
Moderate problem..... 4
Big problem..... 5

8. How would you rate each of the following **during the last 4 weeks**? (Circle one number on each line)

	Very Poor to None	Poor	Fair	Good	Very Good	
a. Your ability to have an erection?.....	1	2	3	4	5	57/
b. Your ability to reach orgasm (climax)?.....	1	2	3	4	5	58/

9. How would you describe the usual QUALITY of your erections **during the last 4 weeks**?

None at all..... 1
Not firm enough for any sexual activity..... 2
Firm enough for masturbation and foreplay only..... 3 (Circle one number) 59/
Firm enough for intercourse..... 4

10. How would you describe the FREQUENCY of your erections **during the last 4 weeks**?

I NEVER had an erection when I wanted one..... 1
I had an erection LESS THAN HALF the time I wanted one..... 2
I had an erection ABOUT HALF the time I wanted one ..... 3 (Circle one number) 60/
I had an erection MORE THAN HALF the time I wanted one..... 4
I had an erection WHENEVER I wanted one..... 5

Do Not Mark in This Space

11. Overall, how would you rate your ability to function sexually **during the last 4 weeks**?

Very poor	1		
Poor	2		
Fair	3	(Circle one number)	64/
Good	4		
Very good	5		

12. Overall, how big a problem has your sexual function or lack of sexual function been for you **during the last 4 weeks**?

No problem	1		
Very small problem	2		
Small problem	3	(Circle one number)	68/
Moderate problem	4		
Big problem	5		

13. How big a problem **during the last 4 weeks**, if any, has each of the following been for you? (Circle one number on each line)

	No Problem	Very Small Problem	Small Problem	Moderate Problem	Big Problem	
a. Hot flashes	0	1	2	3	4	74/
b. Breast tenderness/enlargement	0	1	2	3	4	75/
c. Feeling depressed	0	1	2	3	4	77/
d. Lack of energy	0	1	2	3	4	78/
e. Change in body weight	0	1	2	3	4	79/

THANK YOU VERY MUCH!!