

Socioeconomic Disparities in Patient-Reported Pre- and Post-Treatment Sexual Functions for Localized Prostate Cancer

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Background

- Prostate cancer is the most commonly diagnosed cancer among American men; ~233K new cases in 2014.¹
- 78% of prostate cancers are localized disease at diagnosis in the U.S. 5-year relative survival rate (all stages) is 100%.²
- The evaluation of the effectiveness of treatment for prostate cancer has shifted to health-related quality of life (HRQOL).
- Sexual dysfunction is one of the most common side effects of prostate cancer treatment; it has significantly impacted on HRQOL.

¹Cancer Facts & Figures 2014. Atlanta, ACS 2014.

²CINA, 2007-2011: <http://www.naaacr.org/LinkClick.aspx?fileticket=-vZ7W4BLV8xU%3d&tabid=93&mid=433>

Background

- Many studies that examined the impact of prostate cancer treatment on sexual function lack baseline data.¹
- Data from prostate cancer screening populations suggests lower SES² men are more likely to have sexual dysfunction:³⁻⁵
 - erectile dysfunction
 - ejaculatory and orgasmic dysfunction
 - psychosexual impairment (reduced sexual desire)
- Treatment impact on sexual function cannot be appropriately assessed without baseline data on sexual function.

¹Litwin MS, 2007. ²Socioeconomic Status

³Bhojani N, 2008. ⁴Walz J, 2008. ⁵Chung E, 2014.

Objectives

- Examine socioeconomic (SES) disparities in self-reported pre- and post-treatment sexual functions for localized prostate cancer patients.
- Identify factors that contribute to SES disparities in sexual function decline after treatment.

Methods

- Data source
 - Comparative Effectiveness Analysis of Surgery and Radiation for Localized Prostate Cancer (CEASAR) study¹ surveys
 - Baseline \leq 4 months after diagnosis: 44% response rate
 - follow-up \leq 6 months after baseline: 88% response rate
- Eligibility criteria:
 - Age < 80 years old, Speak English, Louisiana resident, consent to participate
 - Biopsy-proven prostate adenocarcinoma
 - Clinically localized disease (PSA \leq 50 ng/ml)

¹AHRQ funded study of Comparative Effectiveness Analysis of Surgery and Radiation for Localized Prostate Cancer (CEASAR) led by Dr. Penson at the Vanderbilt University Medical Center; four SEER registries participated in this study in 2010-2013.

Methods

- Questions for sexual functions¹ (during the last 4 weeks. For the baseline, prior to any treatment) based on EPIC-26² items 57-58

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

¹ Including sexual bother (item 68).

² Expanded Prostate Cancer Index Composite (Wei JT, 2000)

Methods

- Questions (EPIC¹ items 59-60) for sexual functions (cont.)

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)
- Firm enough for intercourse..... 4

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)
- I had an erection MORE THAN HALF the time I wanted one..... 4
- I had an erection WHENEVER I wanted one..... 5

¹Expanded Prostate Cancer Index Composite (Wei JT, 2000)

Methods

- Questions (EPIC¹ items 64,68) for sexual functions (cont.)

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)
- Good..... 4
- Very good..... 5

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)
- Moderate problem..... 4
- Big problem..... 5

¹Expanded Prostate Cancer Index Composite (Wei JT, 2000)

Methods

- Sexual function scores

Response value	Recode (items 57-60, 64)	Recode (item 68)
1	0	100
2	25	75
3	50	50
4	75	25
5	100	0

- Summary score for each patient is the mean of the recoded scores of all questions ranging 0-100; the higher summary score represents the better sexual function.

Methods

- SES from 6-month survey (except age)
 - Age diagnosis (yrs.): < 65, 65-74, 75/+
 - Race: white, black
 - Household income: ≤ \$30K, >\$30K-\$50K, >\$50K
 - Education: High school (HS) or less, HS graduate or some college, college graduate or higher
 - Insurance: Private, Public (Medicare, VA Health Care, et al), None/Medicaid, Unknown
- Treatment from 6-month survey:
 - surgery, radiation, hormone,
 - watchful waiting/active surveillance/no treatment

Methods

- Statistical analysis with SAS program:

- Frequencies, Mean (95% CI), Chi-Square, and ANOVA
- Multivariate linear regression

Outcome = Summary scores of follow-up survey – Summary scores of baseline survey

Negative value: declined in sexual function

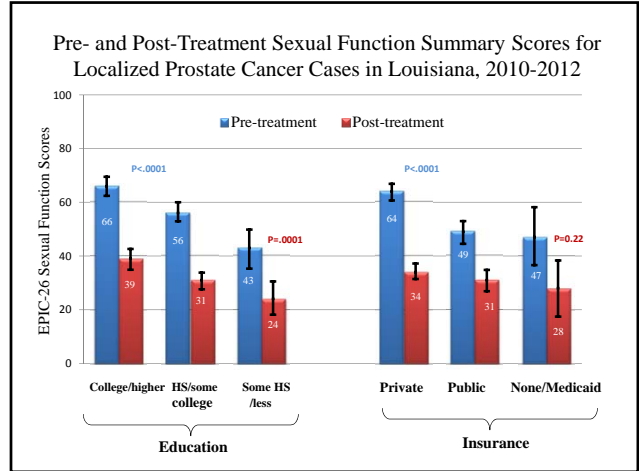
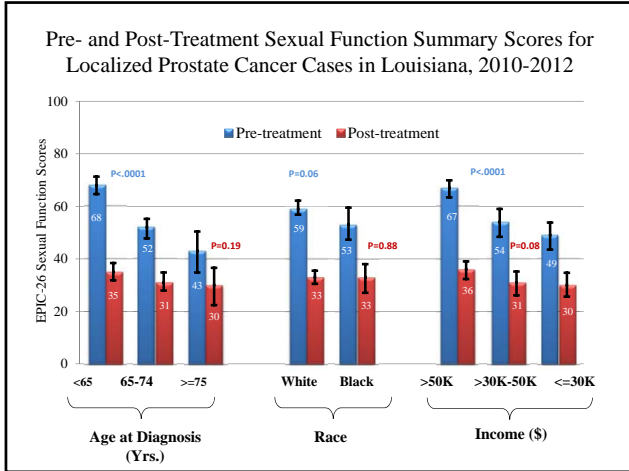
Positive value: improved on sexual function

Zero: remained the same

Results

- 676 localized prostate cancer patients.
 - 90% under age 75, 81% whites, 45% income >\$50K, 52% high school graduate/some college, 61% private insurance, and 6% no insurance/Medicaid
- Poor or very poor sexual function:¹
 - baseline: 36%
 - follow-up (6 months after the baseline): 70%
- The overall summary scores for the sexual function:
 - baseline survey: 58.3
 - Follow-up survey: 32.9

¹ Based on responses to the EPIC-26 question #64: Overall, how would you rate your ability to function sexually during the last 4 weeks?



Association of SES Factors with More Decline in Sexual Function after Treatment. Localized Prostate Cancers Diagnosed Louisiana, 2010-2012

Factors		Co-efficient of Linear Regression Models		
		Crude model ¹	Adjusted model ²	Adjusted model ³
Age	<65	-19.9	-17.6	-2.1
	65-74	-7.1	-7.0	0.8
	>=75	Ref	Ref	Ref
Race	White	-5.6	-0.4	2.1
	Black	Ref	Ref	Ref
Income	<=\$30K	Ref	Ref	Ref
	\$30K - \$50K	-4.5	-4.2	-0.8
	> \$50K	-12.4	-9.5	-2.6

¹ Predictor alone; ² Adjusted for all SES predictors (age, race, income, education and insurance) together
³ Adjusted for all SES predictors (age, race, income, education and insurance) and treatment
 Highlighted in red: p<0.05

Association of SES Factors with More Decline in Sexual Function after Treatment. Localized Prostate Cancers Diagnosed Louisiana, 2010-2012

Factors		Parameter estimates		
		Crude model ¹	Adjusted model ²	Adjusted model ³
Education	Some HS or less	Ref	Ref	Ref
	HS or some college	-7.6	-1.5	-1.1
	College or higher	-8.9	0.9	-1.3
Insurance	Private	-11.6	-4.4	-4.0
	Public	Ref	Ref	Ref
	No/Medicaid	-1.7	1.8	1.7

¹ Predictor alone; ² Adjusted for all SES predictors (age, race, income, education and insurance) together
³ Adjusted for all SES predictors (age, race, income, education and insurance) and treatment
 Highlighted in red: p<0.05

Percent Distribution of Treatment Type by SES for Localized Prostate Cancers Diagnosed in Louisiana, 2010-2012

Factors	Surgery ¹ %	Radiation ² %	Hormone ³ %	No Tx ⁴ %	
Age	<65	70.0	17.7	0.5	12.3
	65-74	41.8	35.4	1.0	21.8
	>=75	5.1	56.4	12.8	25.6
Race	White	53.3	27.7	2.1	17.0
	Black	45.8	33.7	0	20.5
Income	<=\$30K	39.1	40.0	3.6	17.3
	>\$30K - \$50K	50.0	28.1	2.6	19.3
	> \$50K	60.3	22.0	0.5	17.2

¹ Surgery alone & surgery+ any other treatments;

² Radiation alone & radiation + any other treatment except surgery;

³ Hormone as main/only therapy; ⁴ Active surveillance/watchful waiting & no therapy

Percent Distribution of Treatment Type by SES Localized Prostate Cancers Diagnosed in Louisiana, 2010-2012

Factors	Surgery ¹ %	Radiation ² %	Hormone ³ %	No Tx ⁴ %	
Education	Some HS or less	41.7	39.6	2.1	16.7
	HS or some college	53.2	28.6	2.0	16.1
	College or higher	52.9	25.9	1.2	20.0
Insurance	Private	56.8	25.0	0.7	17.6
	Public	40.3	34.5	3.6	21.6
	No/Medicaid*	57.7	38.5	3.9	0.0

¹ Surgery alone & surgery+ any other treatments;

² Radiation alone & radiation + any other treatment except surgery;

³ Hormone as main/only therapy; ⁴ Active surveillance/watchful waiting & no therapy

* Sample size pretty small- 26 cases; 10 with radiation, 15 with surgery and 1 with hormone.

Discussions

- Lower SES patients were more likely to have worse sexual functions than their higher SES counterparts before prostate cancer treatment.
- Sexual functions declined after prostate cancer treatment in all SES groups; larger decline in higher SES group.
- After adjustment for treatment and other SES factors, SES disparities in post-treatment sexual function no longer significant.

Discussions

- It is well known that radical prostatectomy (RP) plays a critical role in decreased sexual function.¹ Adverse sexual function is primarily attributable to non-nerve-sparing surgery.
- The recovery of erectile function after RP can take about year and may be up to 4 years depending upon many factors,²⁻³ such as age, pre-treatment erectile function, etc.
- The sexual function of RP subjects have a greater long-term improvement than those undergoing radiation therapy. Studies reported that erectile dysfunction induced by radiation therapy continued to develop for up to 3 years.⁴

¹Van Tol-Geerdinck JJ, 2013. ² Mulhall JP, 2010. ³ Mulhall JP, 2010; ⁴Potosky AL, 2004

Limitations

- Response rate varied by SES.
- Low response rate.
- Patient reported treatment. Detailed treatment information such as surgical types (laparoscopic or robotic) and radiation types (BT, EBRT, and IMRT) from medical records was not ready for use yet.
- 12-month survey data was not ready for use.
- SES data was from the 6-month survey. Insurance and household income could change from the baseline survey.

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