Sexual Dysfunction and Quality of Life after Treatment for Localized Prostate Cancer: The Role of Sexual Desire and Bother

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This study was supported by a center grant from the National Cancer Institute (1P50CA84944 and U01CA861)
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Prostate Cancer (PC)

- Most common non-skin cancer among U.S. men
  - Over 220,000 new diagnoses in 2011
  - Over 2.2 million current survivors

- Diagnosed in early stages for the majority of men and standard treatment options include radical prostatectomy (RP) and radiation therapy (RT)
  - 5- and 10-year survival rates are 100% and 93%, respectively
Survivorship is often affected by long-standing, disease- and treatment-related side effects that challenge quality of life (QoL). Sexual side effects are particularly distressing. Declines in sexual functioning have been shown to be more severe than age-related morbidity and are experienced across treatment types.
Sexual Function
Between group changes over time, $p < .0001$

Erections firm enough for intercourse* (% Yes)

70% 73% 64% 28%

*Measured using the UCLA – Prostate Cancer Index (UCLA – PCI; Litwin et al. 1998; Hoffman et al., 2004)
Sexual Side Effects
Across Treatment Types

Mean Scale Score*

*Measured using the UCLA – Prostate Cancer Index (UCLA – PC; Litwin et al. 1998; Potosky et al., 2000; 2004)
Sexual Side Effects

- Generally associated with **compromised QOL**
  - Increased distress, depression, and anxiety
  - Body image and masculinity
  - Self-esteem
  - Quality of marital/partner relationships

- However, typically assessed using measures that primarily focus on **physiologic impairment**
  - Erectile dysfunction

- Impact of other domains of **sexuality** on QOL have rarely been considered

(e.g., Beck et al., 2007; Boehmer & Babayan, 2004; Bokhour et al., 2001; Chambers, 2008; Howlett et al., 2010; Nelson, Choi, Mulhali, & Roth, 2007)
Sexuality

- Multidimensional construct

Physical Factors
- Erectile function
- Comorbid conditions

Psychological Factors
- Interest / desire
- Satisfaction

Relationship Factors
- Partner’s ability
- Relationship satisfaction

Sexual Health
Sexuality

- Although PC treatment often leads to decrements in multiple facets of sexuality
  - Erectile dysfunction / impotence
  - Loss of sexual desire
  - Problems with orgasms
  - Overall sexual dissatisfaction

(Chambers, 2008; Schover et al., 2002; Wittmann, Northouse, Foley, Gilbert, Wood, Balon & Montie, 2009)
There is variability in the extent to which men are bothered or distressed by side effects
- Not all men who experience dysfunction are bothered by it
- Measures of dysfunction and bother often uncorrelated

For some men, overall adjustment and well being may be independent of recovery of function

Important to consider different dimensions of sexuality independently in determining effects on QOL

(Chambers, 2008; Schover et al., 2002; Wittmann, Northouse, Foley, Gilbert, Wood, Balon & Montie, 2009)
Sexuality

- Although sexual side effects are generally associated with worse QOL

- Most studies have focused on sexual dysfunction (i.e., physiologic impairment)

- Independent effects of other facets of sexuality, such as sexual desire and bother, have rarely been considered

(Chambers, 2008; Schover et al., 2002; Wittmann, Northouse, Foley, Gilbert, Wood, Balon & Montie, 2009)
It is largely unknown how sexual desire and bother impact QOL among post-treatment PC patients, controlling for the effects of sexual dysfunction.
Furthermore, unknown how socio-demographic and health-related characteristics relate to different aspects of sexuality

- Implications for more general QOL?
Present Study

- Evaluated the direct and indirect effects on QOL
1. Direct effects of sexual desire and bother on QOL would be significant, above and beyond the effects of sexual dysfunction.
2. Indirect effects of baseline characteristics on QOL, through sexual outcomes, would be significant
   - Risk factors associated with decrements in both sexuality and QOL would be identified
Participants were part of a larger NCI-funded study that evaluated the effects of a psychosocial intervention on QOL

- Data from baseline assessment visit (2 weeks prior to the start of the intervention)

Inclusion criteria

- Age 50 or older
- Undergone treatment for localized PC within the past 18 months
- At least a 9th grade reading level

Exclusion criteria

- Prior history of any non-skin cancer
- Significant cognitive impairment
- Active psychiatric symptoms within the past 3 months
  - E.g., posttraumatic stress disorder, psychosis, or alcohol/drug dependence
Measures

- Socio-demographic and health-related covariates
  - Age
  - Ethnicity
  - Education
  - Employment status
  - Household income
  - Medical comorbidities

- PC-related covariates
  - Type of treatment (RP or RT)
  - Time since diagnoses
  - Time since treatment completion
Measures

- Socio-demographic and health-related covariates
  - Current relationship status (yes/no)
  - Ongoing sexual relationship prior to PC diagnosis (yes/no)
  - Pre-treatment sexual functioning (i.e., frequency of sexual activity; times per month)
Sexual outcomes

- UCLA-Prostate Cancer Index (UCLA) for post-RP participants
- Expanded Prostate Cancer Index Composite (EPIC) for post-RT participants
- **Sexual dysfunction** = physiologic impairment
  - Measured using a composite score of 7 items
  - Sample items:
    - “How would you rate the usual quality of your erections?”
  - Higher scores indicate *more* sexual dysfunction
    - Recoded from original scale

(Litwin et al., 1998; Wei et al., 2000)
Measures

- Sexual outcomes
  - UCLA-Prostate Cancer Index (UCLA) for post-RP participants
  - Expanded Prostate Cancer Index Composite (EPIC) for post-RT participants
- Sexual desire
  - Measured using a single item
    - “How would you rate your level of sexual desire during the past four weeks?”
    - 5-point response scale: “0 – Very poor” to “4 – Very good”
  - Higher scores indicate more desire

(Litwin et al., 1998; Wei et al., 2000)
Sexual outcomes

- UCLA-Prostate Cancer Index (UCLA) for post-RP participants
- Expanded Prostate Cancer Index Composite (EPIC) for post-RT participants

Sexual bother

- Measured using a single item
  - “Overall, how big a problem has your sexual function been for you during the last 4 weeks?”
  - 5-point response scale: “0 – No problem” to “4 – Big problem.”

- Higher scores indicate more bother

(Litwin et al., 1998; Wei et al., 2000)
Measures

- QOL
  - Functional Assessment of Cancer – General Module (FACT – G)
    - Measures physical, social/family, emotional, and functional domains of QOL
    - A single item that measures current sexual satisfaction was removed to avoid overlap with other variables in the model
    - A total score was calculated from the remaining 26 items
    - 5-point response scale: “1 – Not at all” to “5 – Very much”
    - Higher scores indicated better QOL

(Cella et al., 1993)
All variables tested for normality
Covariates included based on theory and prior findings

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.
Structural equation modeling

- Full information maximum likelihood (FIML) approach was used to generate parameter estimates

\[\text{Sexual Dysfunction} \Leftarrow \text{Sexual Bother} \Leftarrow \text{Quality of Life} \]

\[\text{Sexual Desire} \rightarrow \text{Quality of Life}\]

Age
- Pre-treatment sexual functioning
- Type of treatment\(^2\)
- Time since diagnosis

Ethnicity\(^1\)
- Education
- Income
- Medical comorbidity
- Time since treatment

\(^1\)Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group
\(^2\)Type of treatment dummy coded with RP as reference group
Structural equation modeling

Model fit indices

- Chi-square statistic ($\chi^2$ p-value > .05); comparative fit index (CFI > .95); standardized root mean square residual (SRMR < .08); root mean square error of approximation (RMSEA < .06)

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group; Kline, 2005

<table>
<thead>
<tr>
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<td>Ethnicity(^1)</td>
<td>Education</td>
<td>Income</td>
<td>Medical comorbidity</td>
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Sexual Dysfunction

Sexual Bother

Sexual Desire

Quality of Life

\(^1\)Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; \(^2\)Type of treatment dummy coded with RP as reference group; Kline, 2005
Participants (N = 260)
- Age: 65 years (SD = 7.6)
- Ethnically diverse
  - 41% Non-Hispanic White, 17% African American/Black, 42% Hispanic
- Education: 13.8 (SD = 3.4)
- Income: $51,000 (SD = $50,000)
- Average of 2 comorbid medical conditions
  - 17% reported diabetes
  - 14% reported cardiovascular disease
Results

- Participants (N = 260)
  - Treatment: 47% RP and 53% RT

- 16 months (SD = 6.9) post-diagnosis

- 10 months (SD = 4.5) post-treatment
Results

- Participants
  - 75% were married or in an equivalent relationship
  - 81% reported to have been in an ongoing sexual relationship prior to PC diagnosis
Results

- Sexual dysfunction
  - Mean = 6.06 (SD=6.1); range of 0–22

- Sexual desire
  - Average response between “poor” to “fair”

- Sexual bother
  - Average response between “small problem” to “moderate problem”
Results

- Quality of life
  - Mean = 85.2 (SD = 13.6)
  - Below average levels of QOL compared to published means
    - Localized PC (RP and RT Means = 92.4 and 90.2, respectively)
    - Age-matched control populations (Mean = 87.1)

(Wei et al., 2002)
Results

Model fit the data

\( \chi^2 \) p-value = .14; CFI = .99; SRMR = .01; RMSEA = .05

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.
Results

- All sexual outcomes were significantly related

*Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; **Type of treatment dummy coded with RP as reference group
More years of education, higher income, and fewer medical comorbidities related to higher levels of QOL.
Sexual desire and bother were significantly related to QOL, but not sexual dysfunction.

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Sexual Dysfunction

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Sexual Bother

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Sexual Desire

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Quality of Life

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β = -.25†

β = .14*

β = .01

*p < .05; **p < .01; †p < .001

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.
Ethnicity → Sexual Bother → QOL

- Hispanic ethnic identification was related to more sexual bother and lower levels of QOL (indirect effect; $\beta=-.04$, $p=.05$)

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.* $p<.05$; **$p<.01$; †$p<.001$

3Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; 2Type of treatment dummy coded with RP as reference group.
Indirect Effects

- Type of treatment → Sexual Bother → QOL
  - RP associated with more sexual bother and lower levels of QOL (indirect effect; $\beta=.08, p<.01$)

*Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.*
Indirect Effects

- Pre-treatment sexual function → Sexual Bother → QOL
  - Better pre-treatment sexual functioning associated with more sexual bother and lower levels of QOL (indirect effect; β=-.06, p<.01)

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.
Summary of Findings

- Although it is widely reported that sexual side effects have a negative impact on QOL, the impact of different domains of sexuality have rarely been considered.

- Degree to which men perceive their sexual side effects as being a problem may be a more significant predictor of QOL than the level of physiologic impairment:
  - Hispanic men
  - RP patients
  - High levels of pre-treatment sexual functioning
Implications

- The majority of men will never fully recover pre-treatment levels of sexual functioning
  - Even with the use of assistive aids and/or medical interventions

- Psychological processes related to sexual dysfunction may be more clinically relevant targets of intervention to ultimately improve QOL
  - Maladaptive cognitions related to perceived loss of masculinity
  - Performance anxiety associated with sexual intimacy
Cross-sectional design precludes causal inferences
  - Although sexual bother conceptualized as a mediating factor, time precedence could not be established

Sexual desire and bother were each assessed using single items
Limitations & Future Directions

- Longitudinal relationships

- Psychosocial interventions among PC survivors
  - Target the effects of treatment on factors that relate to sexual desire and bother, in particular, and maladaptive perceptions of sexual dysfunction
  - Consider risk factors related to sexual bother and QOL
    - Ethnicity
    - Type of treatment
    - Pre-treatment level of sexual functioning
Contributors

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Evaluated the effects of sexual dysfunction, desire, and bother on QOL, controlling for relevant covariates
Present Study

- Determined whether baseline characteristics impacted sexual outcomes directly and whether there were subsequent indirect effects on general QOL
Model evaluated the main effects of sexual dysfunction, desire, and bother on QOL, while considering the effects of relevant covariates.

- Age
- Ethnicity\(^1\)
- Education
- Income
- Medical comorbidity
- Pre-treatment sexual functioning
- Type of treatment
- Time since diagnosis
- Time since treatment

\(^1\)Ethnicity included as two dummy coded variables; Non-Hispanic White reference group
Furthermore, unknown how socio-demographic and health-related characteristics relate to different aspects of sexuality

- Dysfunction, Desire, and Bother

- Socio-demographic and health-related characteristics
  - Sexual Dysfunction
  - Sexual Desire
  - Sexual Bother
Determined whether baseline socio-demographic and health-related characteristics were differentially related to different domains of sexuality
Direct effects of socio-demographic and health-related characteristics would vary across sexual outcomes.
Older age and more medical comorbidities related to more sexual dysfunction

*Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group
RP patients reported more sexual dysfunction and more bother related to sexual side effects than RT patients.
Pre-treatment sexual functioning related to sexual bother ($\beta=.24, p<.01$)

*Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group*
Hispanics reported lower levels of sexual desire ($\beta=-.15, p<.05$) and more sexual bother ($\beta=.14, p<.05$) compared to Non-Hispanic Whites.

Ethnicity included as two dummy coded variables with Non-Hispanic White as reference group; Type of treatment dummy coded with RP as reference group.