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Altered Male Physiologic Function after Surgery for Prostate Cancer: Couple Perspective

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ABSTRACT

Purpose: Both the diagnosis of prostate cancer (PCa) and the physiologic outcomes of surgical treatment impact the male's psychological sphere. However, current research advocates a refocusing of outcomes directed to the PCa "couple". Herein we acquire insight into perspective and concordance regarding male physiological function from the standpoint of a couple recovering from PCa surgery.

Materials and Methods: Couples whereby the male partner had undergone primary surgical treatment for PCa were mailed a Retrospective Sexual Survey (RSS) packet consisting of male and female partner questionnaires. RSS questions surveyed physiological changes in libido, foreplay, erection and arousal, orgasm and ejaculation in addition to perceived psychological impact. Patients' and partners' scores were evaluated to determine the concordance of both individual items as well as domain sums.

Results: Twenty-eight couples completed the questionnaires. Only about 40% of men and women were happy with their levels of sexual interest with 82% concordance. Urine loss during orgasm was reported by 43% of men; the majority of participants were bothered by it. Ejaculation changes were observed by 96% of men (concordance 96%) with most reporting anejaculation. A change in orgasm experience was noted by 86% of men (and 36% of their female partners, $p < 0.0001$). Despite the change, the majority of men and women reported being satisfied with their ability to climax.

Conclusion: Our results indicate that patients and their female partners may interpret differently the same physiological outcomes of PCa surgery. This information could be useful to better counsel the PCa couple and help patients and partners adjust after surgery.

Key words: *prostatic neoplasms; prostatectomy; sexual dysfunction, physiological; couples therapy*
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INTRODUCTION

Prostate cancer (PCa) is the second most lethal cancer for adult men in the United States (1). Many of the patients diagnosed with PCa choose to undergo surgical treatment. The anxiety of cancer diagnosis coupled with the side effect profile associated with surgical treatment impact the male's psychological state (2,3). Prostate cancer surgery will result in variable degrees of impaired urinary control and sexual dysfunction. Research suggests that not only is the patient affected by these events but also the partner (4,5). When men are in a stable relationship, the couple's perspective becomes an important issue and necessitates a refocusing of outcomes directed to the prostate cancer "couple" (5). Although sexual

dysfunction has been shown to be related to psychological impairment in males (2), this aspect has not been yet addressed from a couple perspective.

In this study we acquired insight into the couples' perspective and concordance regarding the physiological male function from a psychological view of the couple recovering from primary surgical treatment for PCa.

MATERIALS AND METHODS

A total of 246 couples whereby the male partner had previously undergone primary surgical treatment for PCa at the Duke University Medical Center by a single surgeon (TJP) between 2002 and 2007 were mailed a Retrospective Sexual Survey (RSS) packet consisting of a specific Institutional Review Board approved informed consent form and male and female questionnaires. Only heterosexual couples being together before and after treatment were enrolled. Male partners received a patient RSS and International Index of Erectile Function (IIEF); female partners received a partner RSS and Female Sexual Function Index (FSFI). The IIEF and FSFI are validated instruments (6,7), while patient and partner RSS are a series of hypotheses generating questions. The RSS consists of 47 items, most assessed in a binary fashion or on a 1 to 5 Likert scale (Appendix 1 and 2 - see on-line Journal http://www.brazjurol.com.br/november_december_2009/Tsivian_673_682_appendix.pdf for details). In this study we focused on RSS questions that surveyed physiological changes in libido, foreplay, erection and arousal, orgasm and ejaculation in addition to psychological burden of postoperative changes on both the patient and his partner.

RSS, IIEF and FSFI scores were recorded. IIEF scores based on a 15-item questionnaire were additionally recalculated to fit a shorter 5-question version, the IIEF-5 (8) which is more familiar to clinicians. RSS responses were compared between patients and partners using Chi-squared or Fisher's exact test as appropriate. Descriptive statistics were generated. Patients' and partners' scores were evaluated in a paired manner to determine the concordance in different RSS questionnaire items and domains to more specifically address couple perspective. Concordance was computed based on each couple responses on each single item. Whenever both the patient and his partner gave the same response it was considered concordant on the particular item. For items graded on a Likert scale, deviation of ± 1 grade was deemed concordant. In calculating concordance rates we excluded couples whenever one of the members did not respond. For Likert scale items, distributions were analyzed and average scores computed. Statistical analysis was performed using SAS software v9 (SAS Institute Inc., Cary, NC). The study was Institutional Review Board approved.

RESULTS

A total of 28 couples completed the questionnaires (response rate of 11.4%) and were enrolled in this study. The patients surveyed were treated between 2002 and 2007 with an average mean follow-up of 28 months after surgery. Patients' median age was 62 years (range 48-75); 82% were Caucasians, 14% African Americans and 4% Native Americans.

Surgical interventions were distributed as follows: 18% cryoablation (20% nerve sparing), 21% robotic radical prostatectomy (0% nerve sparing) and 61% retropubic radical prostatectomy (71% nerve sparing). Male patients had a median IIEF score of 52.5 (range 5-74), corresponding to a shortened IIEF-5 median score of 18 (5-25) after surgery. Of note 10 patients (42%) scored 21 or more on the IIEF-5, indicating good erectile function in our cohort of patients following surgical treatment. Detailed IIEF results are reported in Table-1. A summary of the female partners' FSFI scores is reported in Table-2.

RSS questionnaires evaluated the physiological domains of foreplay, libido, erection and arousal, ejaculation and orgasm; detailed description of the results and the respective concordance rates are reported in Table-3.

No statistically significant differences ($p > 0.05$) we recorded between male patients and their female partners' responses in libido and foreplay domains. There was a > 80% concordance on use and helpfulness of foreplay. While > 70% of pairs stated they utilized more or the same foreplay after

Table 1 – *Male patient IIEF-15 and IIEF-5 scores after surgical treatment of prostate cancer.*

Domain	Median	Range	Mean	Standard Deviation	Possible Scores
Erectile function	22	1-30	18.27	10.63	1-30
Orgasmic function	6	0-10	5.54	3.35	0-10
Sexual desire	7	2-10	6.76	2.18	2-10
Intercourse satisfaction	10.5	0-15	8.73	4.98	0-15
Overall satisfaction	7	2-10	6.64	2.75	2-10
IIEF-15 Total score	52.5	5-74	45.25	20.66	5-75
IIEF-5 total score	18	5-25	15.75	7.83	5-25

IIEF = International Index of Erectile Function.

PCa treatment, the concordance was only 48%. In the libido domain, only 43% of men and 39% of women reported being happy with their level of sexual interest (82% concordance), although the average score was identical (3.21) between patients and partners, response distribution differed between the two sexes; among women "moderate" was the most common response while among men the responses were widely distributed between the different options (Figure-1 A). Out of all men and women, < 40% declared being happy with their partner's level of desire with 86% concordance and similar distribution of responses (Figure-1 B) with an average score of 3.32 and 3.29 for male and female responders, respectively.

Although 43% of patients reported urine loss during orgasm, only 32% of women noticed this (concordance 75%), 58% of men and 60% of their female partners reported being bothered by it. More than one-half of patients and partners reported that the appearance of the patient's penis had changed (71% concordance), of those 29% of men and 14% of women are bothered by the change.

Regarding the erection/arousal domain, couples reported a sensible drop in the number of times sex was initiated after surgery: 50% of men and 39% of women replied 0-2 times in the last 4 weeks (18% and 14% gave the same response when asked about this before surgery). The concordance rates dropped from 93% on initiating sex before surgery to 80% on the item after surgery. Response distribution regarding erection/arousal levels was similar in patients and partners (Figure 2 A and B). Interestingly, 68% of men considered themselves at least partially potent (and so did 61% of women), but the concordance rate

Table 2 – *Female partner FSFI domain scores.*

Domain	Median	Range	Mean	Standard Deviation
Desire	3.6	1.2-6	3.69	1.50
Arousal	4.5	0-6	4.09	1.83
Lubrication	4.95	0-6	3.99	2.18
Orgasm	4.8	0-6	3.99	2.17
Satisfaction	3.8	1.6-5.2	3.60	0.84
Pain	6	0-6	4.43	2.40
Total score	26.3	2.8-34	24.82	8.44

FSFI = Female Sexual Function Index.

was only 59%. Of note, 32% of men reported using medications to improve erections, compared to 85% of women who stated their partner had used medications ($p < 0.0001$). On this question, a 50% concordance rate was registered.

In the orgasm domain, the majority of men reported a change in their experience of orgasm, compared to 36% of their partners, $p < 0.0001$ (concordance 36%). When asked how it changed, 33% of men attributed the change to no ejaculation, 17% said the orgasm was difficult to reach, and 17% reported the orgasm as less intense. When asked about their partner's experience of orgasm, the figures inverted with significantly more men believing that their partner's experience of orgasm had not changed while their partners believed that the patient's experience had changed, $p < 0.0001$ (Figure 3 A and B). Despite the change, the majority of men and women reported being satisfied with their ability to reach orgasm. When asked about their partners, the figures were similar ($p = 1$). A change in ejaculation was observed by 96% men and 89% of women (96% concordance)

Table 3 *– Retrospective sexual survey results and the relative concordance rates. M - male questionnaire question, F - female partner questionnaire question.*

Domain	Question	Response	Male N (%)	Female N (%)	Chi Squared p Value	Concordance (%)
Foreplay	M1/F1 use foreplay?	yes	23 (82)	25 (89)	0.705	89
	M2/F2 how foreplay changed?	more/ the same	21 (75)	20 (71)	1	48
	M4/F4 foreplay helps?	yes	22 (79)	23 (82)	1	81
	M4b/F4b helps whom?	patient partner both	6 (21) 4 (14) 12 (43)	5 (18) 4 (14) 13 (46)	0.937	45
Libido	M1/F1 happy with your sexual interest?	very much / much	12 (43)	11 (39)	1	82
	M2/F2 happy with partner's sexual interest?	very much / much	11 (39)	10 (36)	1	86
	M3/F3 patient loses urine during sex?	yes	12 (43)	9 (32)	0.582	75
	M3b/F3b does this bother?	patient partner both	7 (58) 0 (0) 1 (8)	3 (60) 0 (0) 1 (20)	1	50
	M4/F4 urine loss affects sex?	yes	2 (17)	1 (8)	0.593	86
	M6/F5 patient's penis appearance changed?	yes	17 (61)	15 (54)	0.787	71
	M7/F6 does this bother?	yes	8 (29)	4 (14)	0.329	77
	M8/F7 partner thinks this bothers?	yes	6 (21)	11 (39)	0.245	75

Table 3 *(continued) – Retrospective sexual survey results and the relative concordance rates. M - male questionnaire question, F - female partner questionnaire question.*

Domain	Question	Response	Male N (%)	Female N (%)	Chi Squared p Value	Concordance (%)
Erection / Arousal	M1/F1 your level of erection / arousal?	very high / high	8 (29)	12 (43)	0.403	77
	M1/F2 patient's erection level?	very high / high	8 (29)	8 (29)	1	88
	M2/F3 sex frequency before surgery?	1-2 3-4 5+	5 (18) 9 (32) 14 (50)	4 (14) 0 (0) 11 (39)	0.04	93
	M3/F4 sex frequency after surgery?	0-2 3-4 5+	14 (50) 7 (25) 7 (25)	11 (39) 12 (43) 3 (11)	0.201	80
	M4/F5 consider patient potent?	yes partially	12 (43) 7 (25)	8 (29) 9 (32)	0.503	59
	M5/F6 methods to improve erection?	medications penile injections vacuum device other	9 (32) 2 (7) 2 (7) 1 (4)	23 (85) 1 (4) 2 (7) 1 (4)	< 0.0001	50
	M6/F8 these interrupt sex naturalness?	yes	12 (43)	11 (39)	1	62
Orgasm	M1/F1 your orgasm changed?	yes	24 (86)	10 (36)	< 0.0001	36
	M2/F2 partner's orgasm changed?	yes	5 (18)	23 (85)	< 0.0001	26
	M3/F3 satisfied with your ability to climax?	no sexual activity very / moderately	2 (7) 21 (75)	2 (7) 17 (61)	0.349	68
	M4/F4 satisfied with partner's ability to climax?	very / moderately	21 (75)	20 (71)	1	76
Ejaculation	M1/F1 ejaculation changed?	yes	27 (96)	25 (89)	0.611	96
	M1a/F1a how?	no ejaculation minimal fluid urine loss	15 (54) 3 (11) 3 (11)	13 (46) 8 (29) 2 (7)	0.790	78
	M2/F2 anejaculation bothers?	yes	5 (19)	3 (12)	0.705	83

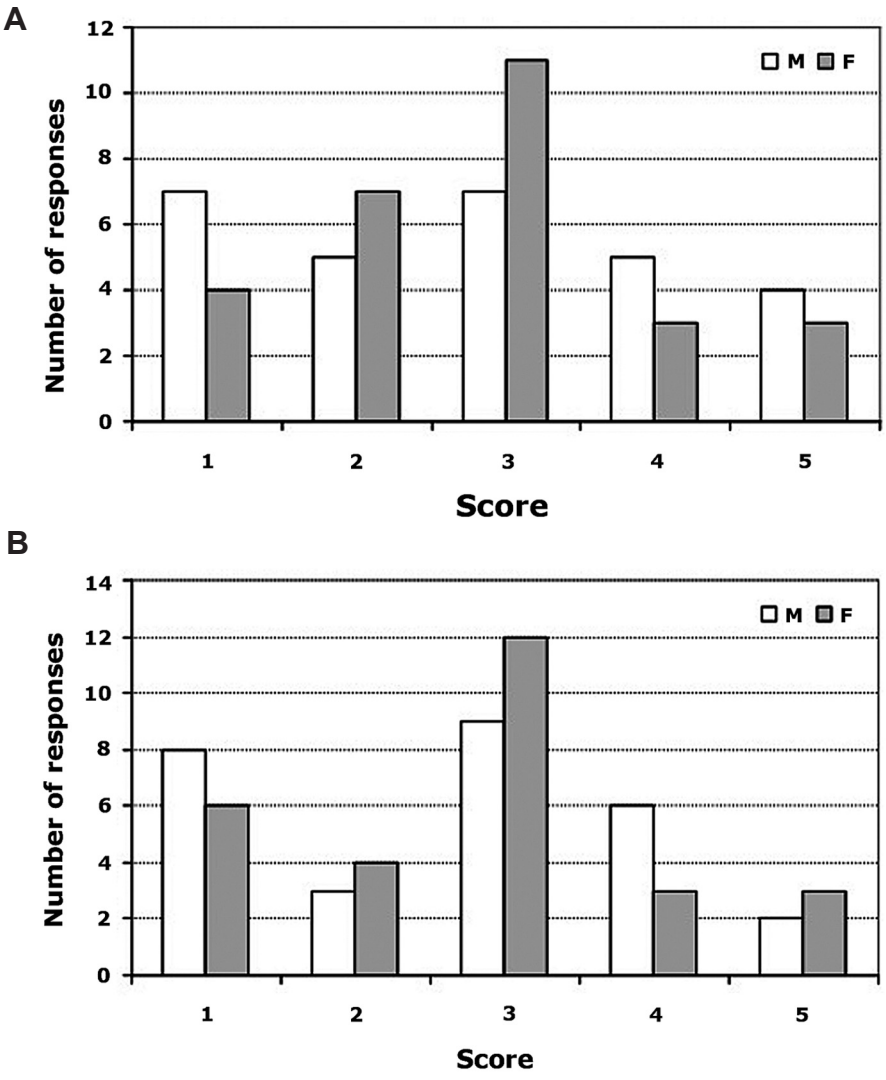

Figure 1 *– Distribution of patient and partner responses on a 1-5 scale (ex.: 5 - very high, 4 - high, 3 - moderate, 2 - low, 1 - very low or not at all). M - male patients, F - female partners. Libido domain. A) Question 1: "Over the last 4 week are you happy with your level of sexual desire or interest?". B) Question 2: "Over the last 4 weeks, are you happy with the level of sexual desire or interest of your partner?"*

with most men reporting no ejaculation. However, only 19% of men and 12% of women were bothered by this.

COMMENTS

Recent research has shown that PCa diagnosis and treatment affects the psychology of both partners in the couple (5,9). In the case of PCa treatment, erectile dysfunction has to be specifically addressed as it represents a common treatment-related outcome. It is agreed that sexual dysfunction impacts male psychology and quality of life (2,10) but the effects on the couple are largely unknown. To the best of our knowledge, this is the first study focusing specifically on couple perspective on sexual function and its psychological impact after surgery for PCa.

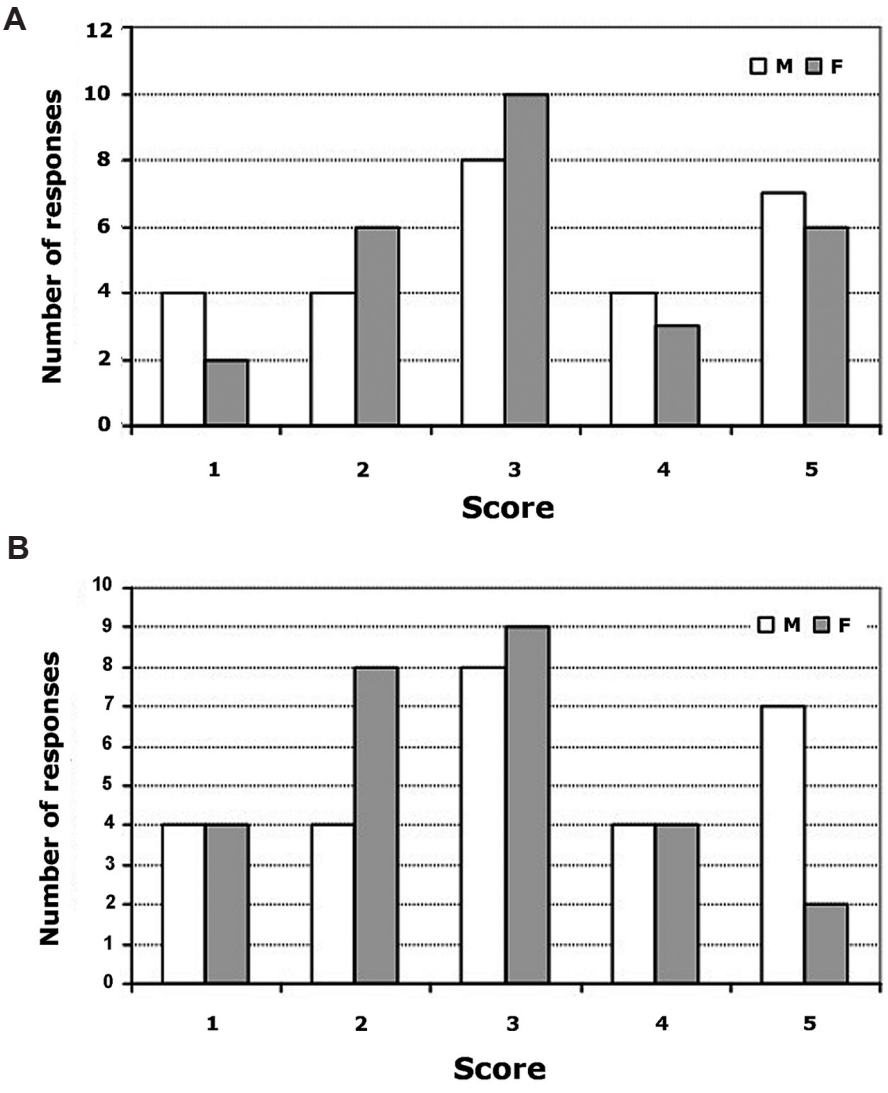

Figure 2 *– Distribution of patient and partner responses on a 1-5 scale (ex.: 5 - very high, 4 - high, 3 - moderate, 2 - low, 1 - very low or not at all). M - male patients, F - female partners. Erection / arousal domain. A) Question 1 (patient) / 1 (partner): "Over the last 4 weeks how would you rate the level of your erection/arousal during sexual activity or intercourse?". B) Question 2 (patient) / 2 (partner): "Over the last 4 weeks, how would you rate the level of your/your partner's erection?"*

Our cohort of patients had variable degrees of erectile dysfunction after PCa surgical therapy when evaluated with the IIEF. More than one-half of the men had some degree of dysfunction reflected in IIEF-5 scores of less than 20 (11). Similarly, among the female partners, the majority may have female sexual dysfunction using a proposed FSFI cutoff value of 26.55 (12). These data suggest that sexual dysfunction following surgery for PCa impacts both members of the couple, and in the female partner the dysfunction is most likely due to a psychological rather than physical impact since only their male partner had undergone surgery. It has been shown that female partners of men with PCa are more distressed and have higher depression scores (5,10). This psychological stress may be reflected in sexual function of those women. It has been previously demonstrated that the partner's distress and the difference in distress between partners impact the

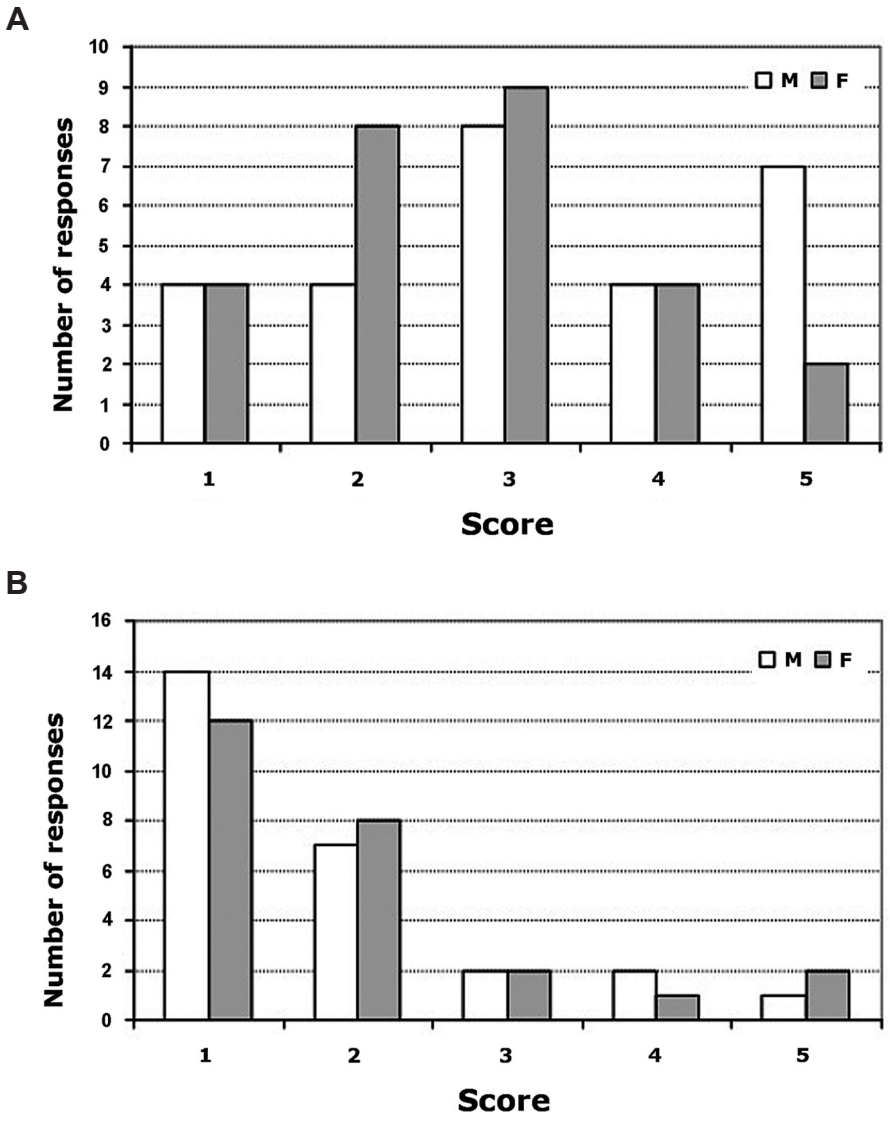

Figure 3 *– Distribution of patient and partner responses on a 1-5 scale (ex.: 5 - very high, 4 - high, 3 - moderate, 2 - low, 1 - very low or not at all). M - male patients, F - female partners. Orgasm domain. A) Question 3: "Over the last 4 weeks, how satisfied are you with your ability to reach orgasm during sexual activity or intercourse after prostate cancer treatment?". B) Question 4: "Over the last 4 weeks. How satisfied are you with your partner's ability to reach orgasm during sexual activity or intercourse?*

quality of life (4), and we suggest that in part this is due to a negative effect on the sexual sphere.

We could appraise that physiological items such as "has the nature of ejaculation changed following surgery?" or "how many times on average was sex initiated?" had higher concordance rates than questions regarding the psychological burden or speculation, as for instance "if yes, does this bother?" or "has your partner's experience changed?". These results further underline the disparities between male and female psychology; such differences may be more evident in stressful situations such as in our setting of couples adjusting to PCa and its treatment effects. These results support the conclusions of several studies that emphasized the disparities in psychological perceptions of PCa couples (4,5,9).

This study highlights several important points. There is solid concordance among couples that foreplay is helpful after PCa treatment. It was also concordant among men and women that 50% suffer from low libido, some of which creates low satisfaction with the partner's libido. It was noted that the initiation of sex declined after surgery. Perhaps this latter observation can in part be explained by the decline in perceived libido. On these items, no significant differences were found in the responses between patients and their partners.

Regarding alterations in physiologic function after PCa treatment, over one-half noticed a change in the appearance of the penis. However, this bothered twice as many men as the female partners; nevertheless, statistical significance could not be reached on this item, probably due to small sample size. Men tended to consider themselves more potent than their female partner's perception. Additionally men believe they relied less on requiring medical assistance to achieve an erection than their female partners thought.

Regarding orgasm, most men felt that their experience had changed after PCa treatment with 96% concordance for anejaculation. The lack of ejaculation after radical prostatectomy is an expected outcome and most couples were not bothered to experience it. Overall, 75% of men were satisfied with their ability to climax despite altered physiological function associated with surgery.

Of interest, nearly one-half of men reported urine loss during orgasm while the majority of female partners were not aware of this. This frequent effect of surgical treatment bothered more than two-thirds of the couples experiencing it. A recent study (13) reported a series of patients suffering from urine loss during orgasm, however the prevalence of this phenomenon was not assessed. Based on their study of patients who lose urine during orgasm, one-half considered this to be a "big social problem". These results are in line with our study, underlining the importance of an increased awareness of this problem as it may impact significantly the quality of life of both the patient and his partner. The incidence of ejaculatory urinary incontinence after radical prostatectomy in the literature ranges from 20% to 93% (14-17) but remains surprisingly underreported and its burden underestimated. In our study we found that near 50% of the patients report losing urine during orgasm and the majority of both patients and their partners are bothered by this phenomenon.

Our survey results may help to better counsel the prostate cancer couple and aid in adjustment to outcomes of PCa surgery. Several studies support the need for such an intervention (4,5,9). The RSS may act as a useful basis for construction and validation of a new instrument that would assess sexual aspects of the PCa couple as well as the related psychological impact of the treatment. Thus, healthcare providers would be able to precisely target psychological interventions that may aid the couple in adjusting to PCa and in coping with the related stress.

Our study is not void of limitations and its results should be evaluated accordingly. First, a low response rate and consequently a small cohort evaluated at different time points after surgery limit the strength of the conclusions since it is difficult to predict the impact of those who did not participate. Second, our study had only a limited means of comparison between before and after surgery, although some questions were structured specifically to review the changes following treatment. An additional limitation is the fact that the RSS is not a validated tool, however we supported it in this preliminary study with validated and widely accepted sexual function assessment tools such as the IIEF and FSFI.

CONCLUSION

In this study, we gained an insight on the intimate sphere of the couple adjusting to PCa treatment outcomes. We were able to highlight several differences in the partners' perspective related to sexual function. This information could be useful for healthcare providers to better counsel the prostate cancer couple and help patients and partners adjust to their condition.

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CONFLICT OF INTEREST

None declared.

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