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Factors related to self-rated health and life satisfaction one year after radical prostatectomy for localized prostate cancer: a cross-sectional survey

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Abstract

Background

Localized prostate cancer affects patient's quality of life in many ways. The aim of this study was to explore factors related to self-rated health and life satisfaction for patients treated for prostate cancer, and to compare the results of these generic quality of life measures to the prostate cancer specific quality of life measure (UCLA Prostate Cancer Index), which focuses on physical functioning.

Material and methods

This cross-sectional survey was carried out among 183 men who underwent radical prostatectomy in 2012–2015 at a university hospital in Finland, and were seen one year post-surgery. Approval from an ethics committee and written consents from participants were received. A questionnaire was used to evaluate patients' perceived quality of life. Logistic regression model, Spearman's correlation, Kruskall-Wallis test and Mann Whitney U test were used to analyze factors related to quality of life.

Results

Of the 183 men in the study, 63% rated their health status as good, and 70% were satisfied with their lives after prostatectomy. Older age and better urinary function were the only factors that explained both better self-rated health and better satisfaction with life. The patients seemed not to interpret problems with sexual function as health-related problems.

In our sample, sexual dysfunction was relatively severe, but patients considered them to be less harmful than urinary or bowel symptoms. Interestingly, 24% of the men with low sexual function did not find that dysfunction bothersome.

Conclusions

Objectively measured physical functioning is not necessarily in line with patients' experienced satisfaction with life and their self-ratings of health. More longitudinal and qualitative research is needed about the meanings that patients attach to physical treatment side effects and the extent to which they can adapt to them over time. With a bigger sample and longer follow-up time it would be possible to identify men who particularly benefited from pre-treatment counselling.

4071 words

Keywords

Prostate cancer, self-rated health, life satisfaction, quality of life, UCLA Prostate Cancer Index

Background

In Nordic countries, nearly 25 000 new prostate cancer cases are diagnosed every year, which means that over 230 000 men are living with the diagnosis. In Finland alone, there are over 49 000 prostate cancer patients alive, and many of them receive therapy for their disease [1]. Prostate cancer treatment options vary according to the stage of the disease from radical alternatives, such as surgical removal of the prostate gland (prostatectomy) and radiation therapy, to hormone therapy and watchful waiting approach. Active surveillance is an option for patients with localized, low risk prostate cancer in which the patient has regular tests to monitor the cancer but not getting curative radical treatment unless needed.

Active surveillance aims at avoiding unnecessary treatment, because radical treatment for prostate cancer often causes major side effects, most commonly urinary incontinence and erectile dysfunction, which may decrease many men's health-related quality of life (HRQoL) permanently [2-4]. As prostate cancer survival rates are relatively high [5], coping with treatment side effects that affect a patient's quality of life (QoL) is a major issue.

Quality of life after prostate cancer treatment has typically been assessed either in terms of treatment side effects or through generic, non-disease specific QoL measures [3, 6-8]. Both measures have their limitations. General HRQoL instruments may not be sensitive enough to detect disease-specific changes in QoL. [9] Symptom-based QoL evaluation, in turn, does not take into account that patients' may interpret same kind of ailments very differently. For instance, few or mild physical postoperative symptoms do not necessarily

mean that the prostate cancer patient experiences a good overall quality of life or feels satisfied with his life after treatment.

When measured only based on symptoms and functioning, a good quality of life before radical prostatectomy seems to predict better QoL after treatment; men with good urinary and sexual function preoperatively will more likely retain their functions better postoperatively [3, 10]. Preoperative symptom-based QoL is associated with the patient's age, race, employment, and level of education: Younger, white, employed, and highly educated men have less incontinence and erectile dysfunction before surgery [3].

When evaluated based on a general HRQoL-measure, such as the SF-36 questionnaire [11] which includes four physical domains and four mental domains, treatment choice seems to affect patients' general physical QoL, but general mental functioning is not greatly affected in early recovery period after treatment. [12] At least older age, absence of comorbidities, better education and income level, availability of social support and absence of social constraints seem to predict better general mental and physical functioning [12, 13]. Also higher self-esteem and self-efficacy are associated with better general QoL in patients with localized prostate cancer. [12]

Life satisfaction is a substantial part of the quality of life, and thus, treatment choice has been found to affect prostate cancer patients' satisfaction with life. Patients treated with hormonal therapy are less satisfied with their lives than are other prostate cancer patients. Most satisfied are those patients treated with internal radiation therapy and patients under active surveillance. [14] Despite the higher satisfaction among active surveillance patients,

however, both active surveillance and watchful waiting can cause anxiety, as the patient has to live with his cancer diagnosis without receiving immediate treatment [15, 16]

HRQoL as a concept emphasises each patient's own views and personal evaluation of his current health [17, 18], which is why self-rated health (SRH) is an important domain to measure. In a previous study, no treatment group differences were found in SRH between patients treated for localized prostate cancer. In addition, patients reported rather good general health despite their treatment choice. [12] SRH has been found to be an independent predictor of survival among prostate cancer patients [19] and in several different types of cancer. The most dramatic decreases in overall health in cancer patients occurs within the first year of cancer diagnosis when the patients are undergoing treatment. After this SRH begins to return to pre-cancer levels. Unlike in lung, breast, or colorectal cancer, prostate cancer patients do not experience same decline in SRH at the time of diagnosis, which is most probably due to earlier diagnosis and lesser symptoms at this time point. [20]

To address the gap between these two different approaches to quality of life (symptom-based vs general QoL), we measured HRQoL by evaluating patients' self-rated health and satisfaction with life, and compared the results of these subjective assessments against a more objective (though self-reported) prostate cancer specific QoL-measure, which focuses on physical functioning. Our study questions were:

1. What factors are associated with (a) self-rated health and (b) satisfaction with life one year after radical prostatectomy?
2. How do the associated factors differ for the Prostate Cancer Index, life satisfaction and self-reported health?

Material and methods

A survey was conducted in 2012–2015 at a university hospital in Finland after the study received its approval from a regional ethics committee (R12025/ Apr 17th 2012). Approximately 500 prostate cancer patient (all treatment modalities included) are being cared in this hospital per year. Nurses working at the urology outpatient clinic gave a questionnaire and a consent form to the prostate cancer patients when they came to one-year post-surgery check-up. Patients who were willing to participate after receiving information of the study filled in the questionnaire and written consent and returned them to their doctor. A total of 183 questionnaires were returned out of approximately 350 questionnaires given to patients.

We used the UCLA Prostate Cancer Index (UCLA PCI) [9] to measure the prevalence of treatment side effects. UCLA PCI contains 20 disease-targeted items that evaluate urinary, sexual, and bowel function and symptom-related bother. Also patient-perceived treatment satisfaction was asked using an original UCLA PCI question. UCLA PCI has proved to have a good cross-cultural validity [9]. Additionally, we asked the patients about their perceptions about their health status, life satisfaction, sufficiency of patient guidance, and prevalence of pre-treatment erectile dysfunction. The used questions and distributions of patients' answers to them are shown in Table 1.

We used a single Likert-scale item of the questionnaire to assess SRH: "How would you rate your current health?" [21] (Very good/ Fairly good/ Average/ Fairly poor/ Poor). Because our purpose was to distinguish men who clearly stated feeling healthy from those men who had a perception of having either average or even poorer health, we transformed

the Likert-scale variable into binomial form. In the new outcome variable, the patient was classified in group “Good SRH”, if he had answered “Fairly good” or “Very Good” to the question, and, the if he had answered something else, the patient was classified in group named “Average or poor health”.

Following the same principle, we composed a binomial outcome variable for satisfaction with life. We used the question, “How satisfied are you with your life as it is?” [22] to produce the outcome variable for life satisfaction. If the patient answered “Very satisfied” or “Satisfied”, he was classified in the group “Clearly satisfied”, and if he answered something else (Somehow satisfied/ Unsatisfied/ Very unsatisfied/ I don’t know), he was classified as “Less satisfied”.

Although some information was lost by simplifying the data from multi-categorical into binomial format, these stratifications were more clinically relevant when assessing an interpretative topic, such as a patient’s self-reported quality of life. After all, in this study, the focus was to examine factors related to *good* SRH and *clear satisfaction* with life instead of general satisfaction level or health status. Similar categorization had also been used earlier in other prostate cancer studies [19, 23, 24]. Also treatment satisfaction variable and pre-treatment erectile dysfunction variable were used in binomial form in the analyses.

Data on age and cancer-related clinical characteristics (serum PSA level, tumor Gleason score, percentage of cancer tissue in biopsy sample, tumor T stage, tumor margin status, and treatment received) were collected from the hospital register. Tumor Gleason score determines the aggressiveness of the cancer: The higher the score is on scale from 2 to

10, the more likely the cancer will spread. Age, PSA (prostate specific antigen) level, and percentage of cancer tissue in the biopsy were used as continuous variables throughout the analysis, while other clinical characteristics were used in categorical form. Marital status and occupation were not systematically reported in the hospital register, so they had to be left outside the analysis.

The relationships between categorical outcome variables and continuous explanatory variables were described using median, Q_1, and Q_3 and tested with Mann-Whitney U. We used cross-tabulation and Chi square test for the categorical explanatory variables. Univariate logistic regression analysis was performed to identify factors predicting good SRH and satisfaction with life. Independent variables that were significantly associated with either of the outcome variables in the univariate model were then further evaluated in a multivariate logistic regression model. We left the UCLA PCI bother scales out of the logistic regression models, for they correlated with the corresponding function variables. Also, the variables that considered received treatment (e.g., radiation therapy, hormonal therapy) had to be left outside all the analyses due to their small number of cases. All chosen variables were placed in the logistic regression model at the same time to control for confounding.

We followed the scoring instructions of the UCLA PCI, and calculated average values for function and bother scales. UCLA PCI has only been validated as a continuous scale [9], so the function and bother variables were used as continuous throughout the analysis. Spearman's correlation, median, Q_1, and Q_3 were used to describe the association between explanatory variables and the PCI scores. Associations were tested using the Kruskall-Wallis test and the Mann Whitney U test. We chose $p<0.05$ as the threshold level

for statistical significance. The data was analyzed using the IBM SPSS Statistics 23 program.

Results

Characteristics of the respondents

The study population consisted of 183 Finnish men being treated for prostate cancer. All men underwent radical prostatectomy as their primary treatment. Some patients (10%) were under active surveillance before radical treatment. The median time of active surveillance was 18 months. Five patients received anti-androgen therapy pre-operatively, as they were participating in a study of local anti-androgens effect on the prostate [25]. Post-operatively, eight patients received radiation therapy, and endocrine treatment was carried out on four patients.

The men were aged 48 to 75 years. Most patients (64%) had a Gleason score of 7, and all the patients had either localized (T2) or locally advanced (T3) prostate cancer (Table 1). Only two patients had lymph node involvement (stage N1). Blood PSA levels varied between the minimum of 1.3, and the maximum of 44.9 µg/l at the time of diagnosis. Most patients had a negative margin status in their tumor (Table 1). In the diagnostic biopsy samples, the percent of cancer tissue varied between <1% and 75%.

(Table 1 here)

In this study population, median scores for urinary function were clearly better than they were for sexual function, whereas median urinary function was clearly lower than median bowel function (see Table 1.). Urinary scale was the only scale in which median bother was worse than median function. The median values in urinary function and bother were parallel. Problems with bowel function and bother related to it were scarce among participants. Less than half of the men had experienced erectile dysfunction prior to treatment. A clear majority of patients were clearly satisfied (Very satisfied / Satisfied) with received cancer treatment and majority also felt that patient guidance offered had been sufficient.

Factors related to SRH

Most patients (63%) rated their health as good (Very or Fairly good) one year after prostatectomy (Table 1). As Table 2 shows, men who rated their health as good were older than men with average or poor SRH. Men with good SRH had higher PSA values and a lower percentage of cancer tissue in the diagnostic biopsy sample. There was no statistically significant difference between the two groups of patients in Gleason score, T stage, or margin status. Men who were clearly satisfied with cancer treatment were more likely to report good SRH. Experiencing patient guidance as sufficient was also more common in good SRH group, but the difference was not statistically significant.

(Table 2 here)

Men with good SRH had significantly better urinary and bowel function and bother scores than did men experiencing average or poor SRH. Also, their sexual function was superior,

but the difference was not statistically significant. There was no difference in sexual bother between the two groups. As Table 2 shows, at least 25% of the men with good SRH experienced great bother from their sexual dysfunction (Q_1=0). Men who had never experienced pre-treatment erectile dysfunction usually rated their health status as good.

In a multivariate logistic regression analysis, we found that higher age, higher preoperative PSA level, lower percentage of cancer tissue in biopsy sample, satisfaction with treatment, and better urinary function were statistically significantly associated with good SRH (see Table 3).

(Table 3 here)

Factors related to life satisfaction

Of the participants in this study, 70% were clearly satisfied (Very satisfied or Satisfied) with their lives one year after prostatectomy (Table 1). As seen in Table 2, clearly satisfied men were older than less satisfied men. There was no statistically significant difference in the PSA, Gleason score, T stage, or margin status between the two groups, but less satisfied men did have a higher percentage of cancer tissue at their diagnostic biopsy.

A clear satisfaction with cancer treatment was markedly more common among men clearly satisfied with their lives, similarly, being less satisfied with treatment was more common among men feeling less satisfied with life. Also, patient guidance was more commonly experienced as being sufficient among clearly satisfied men.

Clearly satisfied men had better urinary, sexual, and bowel function and bother scores. Especially, sexual bother scores were markedly better among these men. Still, at least 25% of clearly satisfied men experienced great bother from sexual dysfunction (Q_1=0). There was no statistically significant difference between the two groups in the prevalence of erectile dysfunction before cancer treatment.

Using multivariate logistic regression analysis (see Table 3) we found that higher age and better urinary and sexual function were statistically significantly related to satisfaction with life one year after prostatectomy. Satisfaction with treatment was almost statistically significantly associated with life satisfaction.

Factors related to urinary, sexual, and bowel function

Men who were clearly satisfied with their received cancer treatment had significantly better urinary function than did less satisfied men (see Table 4.). Also men who perceived patient guidance as sufficient had better urinary function than did those men who did not. There was no association between urinary function and age, PSA, percentage of cancer tissue in biopsy, Gleason score, T stage, or margin status.

(Table 4 here)

Sexual function correlated with patient's age and experienced sexual bother. In general, all correlations were weak. Still, older men had worse sexual function. (Table 4) All of the study participants had at least some erectile dysfunction, for the maximum sexual function score was only 88 among all study participants. Although sexual function clearly correlated

with sexual bother (Table 4), 22 of the 92 men (24%) with very low sexual function (0-24 function scores) experienced very little or no bother (75-100 bother scores) (data not shown). In terms of urinary or bowel function and bother, we did not find a similar group of men who reported experiencing little or no bother despite severe symptoms.

Men with higher Gleason scores had significantly worse sexual function (Table 4.). Also, men who were satisfied with their cancer treatment had significantly better sexual function. Pre-treatment erectile dysfunction was also associated with sexual function: Men who reported having erectile dysfunction at least sometimes pre-operatively had clearly lower function one year after radical prostatectomy. Sexual function was not associated with serum PSA, percentage of cancer tissue in the biopsy sample, T stage, margin status, or perceived sufficiency of patient guidance. Bowel function was only associated with bowel bother.

Discussion

Our study showed that there were both similarities and differences in the factors related to our generic QoL-measures (SRH and life satisfaction) and UCLA PCI function domains. Satisfaction with treatment was associated with SRH, life satisfaction, sexual function, and urinary function. Clinical cancer characteristics had associations only with SRH and sexual function, but none of these characteristics were related to both of them. Older age, on the other hand, was associated with better self-rated health, higher life satisfaction, and worse sexual function, although age was not associated with urinary function.

Older men felt healthier and more satisfied with their lives than did younger men despite treatment side effects. This finding is in line with Chambers et. al. study [13] that noted younger men being less satisfied with life after prostate cancer, which was assumed to derive from active careers, active sexual life and greater financial responsibilities. Also, in assessing their own health, people adjust these assessments to their age group's assumed state of health. Therefore, younger men may interpret their dysfunctions more easily in terms of poor health when comparing themselves to age mates [26].

There was a clear relationship between good sexual function and satisfaction with life. This result is easy to understand, for sexual capability and sexual activity are often seen as crucial aspects of masculine identity and the role of man [27]. All participants in this study had some problems with sexual function, which was linearly associated to sexual bother. However, to our surprise, there were men who did not experience corresponding sexual bother from their severe sexual dysfunction. This result cannot be fully explained by endocrine treatment or anti-androgen therapy, for only nine patients received either of these. There were also some men who experienced substantial sexual bother, but they were still satisfied with their lives. It would be important to further study to what extent these associations between sexual function and bother and life satisfaction can be explained only in terms of patients' age.

Contradictions like these have been noted in earlier studies, where men reported good QoL despite the high prevalence of treatment side effects [28]. More comprehensive knowledge of the patients' background, such as marital status and family situation could partially help explain the contradiction we found. Unfortunately we were not able to collect data on these from the hospital register as we had presupposed. It would be plausible to

suggest that men with a supportive partner will better adapt to erectile dysfunction, for partners often provide emotional support and encourage their men to seek rehabilitation activities. [29-31].

We noted that the median sexual function was clearly lower than the median urinary function. Also, urinary incontinence impaired both SRH and life satisfaction, whereas even quite burdensome erectile dysfunction did not affect SRH. Apparently, men do not interpret problems with sexual function as a health issue in the same way that they do urinary incontinence. It is known that men tend to normalize erectile dysfunction caused by cancer treatment by interpreting the symptoms as part of the normal aging process and by stating that sexual activity is mainly part of a younger man's life [27, 28, 32-34]. This view may also explain why the participants of this study did not necessarily take erectile dysfunction into account when answering the general questions about their health [28].

Urinary incontinence caused by cancer treatment is not typically interpreted as an age-related issue. Over time, patients adjust to their new, worse urinary function and find it fairly easily manageable [35]. In this study, the inquiry was conducted one year after prostatectomy, and therefore the patients had perhaps not been able to adapt to the symptoms yet, as the effect of urinary function on their SRH and life satisfaction was strong.

However, life situation affects perceived urinary bother, which in earlier studies have been found to be independently related to satisfaction with life [24]. Urinary incontinence has a major impact especially on working-aged men. Men feel anxiety about hiding their physical impairment at work, and practical issues involved in maintaining dryness can cause

emotional distress [36]. On the other hand, patients may feel grateful for being alive after cancer treatments, which makes urinary incontinence seem less of a problem than losing one's life [28]. In case of prolonged side effects, however, treatment benefits, such as disease control, may also lose their importance for the patient if the side effects substantially complicate daily life [37].

A surprising result of our study was that men with a higher preoperative serum PSA level reported better self-rated health than did men with a lower PSA level. Similar findings have been reported earlier, where prostate cancer survivors who regretted their treatment choice had a less severe case of cancer based on PSA and Gleason score [38]. It is also known that prostate cancer patients tend to perceive their illness by using concrete numerical information [39], and they keep track of their illness trajectory through their PSA level, often by comparing their test results with those of other men [34, 40]. It thus appears plausible to suggest that men with higher PSA levels could experience less regret about treatment because they feel that there was no other choice than to have their cancer treated, regardless any possible treatment side effects.

Our study has several limitations. Cross-sectional study design limits the ability to draw valid conclusions about possible causality. Therefore, a longitudinal design with a bigger sample is needed to confirm these associations. Secondly, there were wide confidence intervals for some of the variables related to SRH or satisfaction with life, although some of the relationships were statistically significant. The reason for these wide confidence intervals was partly due to the small number of participants (n=183). Also, almost all correlation coefficients were low. Certain demographic parameters (family situation, marital

status, socioeconomic status), which may be associated with life satisfaction, SRH, or perceived bother, were not available in this study.

Conclusions

Symptom-based evaluation of QoL often contradicts with general QoL measures that are based on patients' own perceptions of health and life satisfaction. The meanings, which patients attach to treatment side effects, and the extent to which they can adapt to those side effects over time, need more longitudinal and qualitative research [37, 41]. With a bigger sample and longer follow-up time, it would be possible to identify men that particularly benefited from pre-treatment counselling or other psychosocial services.

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List of abbreviations

HRQoL = health-related quality of life

PSA = prostate specific antigen

QoL = quality of life

SRH = self-rated health

UCLA PCI = UCLA Prostate Cancer Index

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TABLE 1. Characteristics of study population.

	n (%)	Md (Q_1, Q_3)
Age, yrs		66 (62.0, 69.5)
Gleason score		
≤ 6	53 (29.0 %)	
3+4	90 (49.2 %)	
4+3	27 (14.8 %)	
≥ 8	13 (7.1 %)	
T stage		
T2	113 (62.4 %)	
T3	68 (37.6 %)	
PSA level, µg/l		6.7 (5.2, 9.1)
Margin status		
Positive	49 (27.5 %)	
Negative	129 (72.5 %)	
Percentage of cancer tissue in biopsy sample		10 (5.0, 20.0)
Urinary function		76.8 (55.0, 93.4)
Urinary bother		75.0 (50.0, 100.0)
Sexual function		19.8 (6.3, 44.8)
Sexual bother		25.0 (0.0, 75.0)
Bowel function		93.8 (85.5, 93.8)
Bowel bother		100.0 (75.0, 100.0)
Did you have erectile dysfunction prior to cancer treatment?		
Often	15 (8.3 %)	
Sometimes	63 (35.0 %)	
Never	102 (56.7 %)	
Do you feel that you were given enough information and guidance about the disease and treatment?		
Yes	148 (83.6 %)	
No	29 (16.4 %)	
Overall, how satisfied are you with the cancer treatment you received?		
Very satisfied	73 (40.8 %)	
Satisfied	77 (43.0 %)	
I don't know	14 (7.8 %)	
Unsatisfied	5 (2.8 %)	
Very unsatisfied	10 (5.6 %)	
How would you rate your current health?		
Very good	21 (11.5 %)	
Fairly good	94 (51.4 %)	
Average	46 (25.1 %)	
Fairly poor	19 (10.4 %)	
Poor	3 (1.6 %)	
How satisfied are you with your present life?		
Very satisfied	29 (15.8 %)	
Satisfied	99 (54.1 %)	
Somehow satisfied	41 (22.4 %)	
Unsatisfied	9 (4.9 %)	
Very unsatisfied	4 (2.2 %)	
I don’t know	1 (0.5 %)	

TABLE 2. Association of explanatory variables to self-rated health and life satisfaction.

Variables	Self-rated health					Life satisfaction				
	Good SRH (n=115)		Average or poor SRH (n=68)			Clearly satisfied (n=128)		Less satisfied (n=55)		
	n (%)	Md (Q_1, Q_3)	n (%)	Md (Q_1, Q_3)	p-value	n (%)	Md (Q_1, Q_3)	n (%)	Md (Q_1, Q_3)	p-value
Age, yrs		67.0 (64.0, 70.0)		63.5 (58.3, 68.8)	0.001		67.0 (63.0, 70.0)		64.0 (60.0, 68.0)	0.013
PSA level, µg/l		6.9 (5.3, 9.2)		6.2 (4.7, 8.2)	0.037		6.7 (4.8, 9.1)		6.7 (5.3, 9.1)	0.609
Percentage of cancer tissue in biopsy sample, %		7.0 (4.0, 15.0)		12.0 (6.0. 20.0)	0.005		8.0 (4.0, 16.5)		12.0 (7.0, 20.0)	0.006
Gleason score					0.885					0.434
≤ 6	33 (62.3 %)		20 (37.7 %)			40 (75.5 %)		13 (24.5 %)		
7	73 (62.4 %)		44 (37.6 %)			78 (66.7 %)		39 (33.3 %)		
≥ 8	9 (69.2 %)		4 (30.8 %)			10 (76.9 %)		3 (23.1 %)		
T stage					0.792					0.566
T2	72 (63.7 %)		41 (36.3 %)			81 (71.7 %)		32 (28.3 %)		
T3	42 (61.8 %)		26 (38.2 %)			46 (67.6 %)		22 (32.4 %)		
Margin status					0.376					0.252
Positive	28 (57.1 %)		21 (42.9 %)			31 (63.3 %)		18 (36.7 %)		
Negative	83 (64.3 %)		46 (35.7 %)			93 (72.1 %)		36 (27.9 %)		
Satisfaction with treatment					0.029					<0.001
Clearly satisfied	102 (66.2 %)		52 (33.8 %)			116 (75.3 %)		38 (24.7 %)		
Less satisfied	13 (44.8 %)		16 (55.2 %)			12 (41.4 %)		17 (58.6 %)		
Sufficiency of patient guidance										0.005
Sufficient	94 (63.5 %)		54 (36.5 %)		0.397	110 (74.3 %)		38 (25.7 %)		
Not sufficient	16 (55.2 %)		13 (44.8 %)			14 (48.3 %)		15 (51.7 %)		
Urinary function		81.8 (65.0, 100.0)		65.9 (42.1, 86.0)	<0.001		81.8 (65.0, 100.0)		58.4 (28.4, 81.8)	<0.001
Urinary bother		75.0 (75.0, 100.0)		62.5 (25.5, 100.0)	<0.001		75.0 (75.0, 100.0)		50.0 (25.0, 75.0)	<0.001
Sexual function		20.8 (6.3, 49.0)		17.7 (4.7, 30.3)	0.146		24.0 (6.8, 50.0)		16.6 (0.0, 29.1)	0.011
Sexual bother		25.0 (0.0, 75.0)		25.0 (0.0, 56.3)	0.087		50.0 (0.0, 75.0)		0.0 (0.0, 25.0)	<0.001
Bowel function		93.8 (88.4, 100.0)		88.1 (75.9, 93.8)	<0.001		93.8 (87.5, 100.0)		88.8 (75.5, 93.8)	<0.001
Bowel bother		100.0 (75.0, 100.0)		75.0 (50.0, 100.0)	0.001		100.0 (75.0, 100.0)		75.0 (50.0, 100.0)	<0.001
Pre-treatment erectile dysfunction					0.063					0.646
Sometimes or often	43 (55.1 %)		35 (44.9 %)			56 (71.8 %)		22 (28.2 %)		
Never	70 (68.6 %)		32 (31.4 %)			70 (68.6 %)		32 (31.4 %)		

TABLE 3. Multivariate logistic regression models for self-rated health and life satisfaction.

Variables	Self-rated health			Life satisfaction		
	OR	**95 % CI[1]**	**p-value**	**OR**	**95 % CI**	**p-value**
Age	1.08	1.02-1.15	0.014	1.08	1.01-1.17	0.029
PSA level	1.17	1.05-1.30	0.006			
Percentage of cancer tissue in biopsy sample	0.97	0.94-0.99	0.020			
Satisfaction with treatment			0.049			0.055
Clearly satisfied	2.60	1.00-6.75		2.89	0.98-8.54	
Less satisfied	1.00			1.00		
Sufficiency of patient guidance						0.224
Sufficient				1.94	0.67-5.64	
Not sufficient				1.00		
Urinary function	1.02	1.00-1.03	0.027	1.04	1.02-1.05	<0.001
Sexual function				1.02	1.00-1.04	0.028
Bowel function	1.03	1.00-1.06	0.074	1.02	0.99-1.06	0.121

[1]Confidence interval

If a value is not presented in the table, the variable was not significantly related to the outcome variable in the univariate logistic regression.

TABLE 4. Association of explanatory variables to UCLA PCI scores.

Variables	Urinary function			Sexual function			Bowel function		
	r	Md (Q_1, Q_3)	p-value	r	Md (Q_1, Q_3)	p-value	r	Md (Q_1, Q_3)	p-value
Age, yrs	0.108			-0.331			0.080		
PSA level, µg/l	-0.030			-0.118			-0.159		
Percentage of cancer tissue in biopsy sample, %	-0.138			-0.164			-0.151		
Urinary/Sexual/Bowel bother	0.793			0.440			0.723		
Gleason score			0.965			0.043			0.983
≤ 6		76.8 (55.4, 96.7)			29.1 (9.4, 54.7)			93.8 (85.5, 93.8)	
7		76.8 (53.4, 93.4)			16.6 (6.3, 41.6)			93.8 (81.9, 95.0)	
≥ 8		81.8 (64.2, 91.7)			15.6 (3.1, 29.1)			93.8 (85.5, 93.8)	
T stage			0.746			0.461			0.915
T2		76.8 (58.4, 93.4)			21.9 (6.3, 49.0)			93.8 (85.5, 93.8)	
T3		79.3 (53.4, 93.4)			18.8 (6.3, 41.6)			93.8 (81.3, 100.0)	
Margin status			0.916			0.564			0.438
Positive		81.8 (53.4, 90.9)			19.8 (1.6, 43.3)			93.8 (78.4, 97.5)	
Negative		76.8 (55.4, 93.4)			19.8 (6.3, 43.5)			93.8 (85.5, 93.8)	
Satisfaction with treatment			0.027			0.001			0.738
Clearly satisfied		80.3 (55.0, 95.0)			22.9 (6.3, 48.9)			93.8 (85.5, 93.8)	
Less satisfied		65.0 (38.3, 84.6)			10.4 (0.0, 25.0)			93.8 (78.1, 100.0)	
Sufficiency of patient guidance			0.052			0.689			0.919
Sufficient		80.0 (58.4, 95.0)			19.8 (6.3, 45.9)			93.8 (85.5, 93.8)	
Not sufficient		68.8 (48.4, 82.6)			19.3 (12.5, 29.1)			93.8 (85.5, 100.0)	
Pre-treatment erectile dysfunction						<0.001			
Sometimes or often					9.9 (3.1, 24.8)				
Never					29.1 (13.5, 52.9)				