

## MEN'S SEXUAL HEALTH

## Scandinavian Prostate Cancer Patients' Sexual Problems and Satisfaction With Their Sex Life Following Anti-Cancer Treatment

Gert Martin Hald, PhD,<sup>1</sup> Mie Dahl Pind, Msc,<sup>1</sup> Michael Borre, PhD,<sup>2</sup> and Theis Lange, PhD<sup>1</sup>

## ABSTRACT

**Introduction:** Active prostate cancer treatment is often associated with significant adverse physiological and psychological effects including significant sexual problems. Most studied among these sexual problems is erectile dysfunction while related sexual bothers such as overall sexual function and satisfaction with one's sex life are much less studied.

**Aim:** To investigate problems related to erectile functioning, orgasmic ability, sexual function, and satisfaction with one's sex life among a cohort of Scandinavian prostate cancer patients age 40 years and older who were sexually active prior to their diagnosis of prostatic cancer.

**Methods:** The survey study used a cross-sectional design and a mixed recruitment procedure. Patients were recruited through the prostate cancer patient advocate organizations in Denmark, Norway, and Sweden (Scandinavia). The final sample included 1,707 prostate cancer patients. For analyses, participants were stratified into 4 groups according to their total treatment burden.

**Outcomes:** Outcomes included subjective reporting of erectile functioning, orgasm, and sexual functioning, and satisfaction with one's sex life.

**Results:** The study found that the prevalence of erectile dysfunction and problems related to orgasm and overall sexual function ranged from 72–92% across prostatic cancer treatment groups. Conversely, this range was 61–69% among the respondents who had not undergone prostatic cancer treatment. Across treatment groups, a minority of patients (<15%) reported being satisfied with their sex lives. After socio-demographic variables were controlled for, patients who did not receive prostatic cancer treatment were 3.75 times more likely than those in the reference group to not report sexual function problems.

**Conclusion:** Among older prostate cancer patients, who at their time of diagnose were sexually active, sexual satisfaction is low and prevalence rates of sexual problems is high, thus underlining the strong clinical need to address sexual problems and satisfaction among this cohort of patients in order to promote sexual health and well-being following active cancer treatments. **Martin Hald G, Dahl Pind M, Borre M, et al. Scandinavian Prostate Cancer Patients' Sexual Problems and Satisfaction With Their Sex Life Following Anti-Cancer Treatment. Sex Med 2018;6:210–216.**

Copyright © 2018, The Authors. Published by Elsevier Inc. on behalf of the International Society for Sexual Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Key Words:** Prostate Cancer; Erectile Dysfunction; Orgasmic Problems; Sexual Functioning; Sexual Satisfaction

## INTRODUCTION

Prostate cancer is the most prevalent type of male cancer in the United States<sup>1,2</sup> and is among the leading causes of male cancer

deaths worldwide with mortality being among the highest in the Scandinavian countries.<sup>3</sup>

Active prostate cancer treatment is often associated with significant adverse physiological and psychological effects, including muscular weakness, hot flushes, reduced urinary and bowel functioning, depression, reduced quality of life, and sexual problems.<sup>4–9</sup> Prostatic cancer treatment usually involves observation (active surveillance), surgery, radiation therapy, hormonal treatment, and chemotherapy.<sup>10–12</sup>

Men with prostate cancer often experience increased rates of sexual problems and reduced sexual functioning at baseline

Received January 28, 2018. Accepted June 7, 2018.

<sup>1</sup>Department of Public Health, University of Copenhagen, Denmark;

<sup>2</sup>Department of Urology, Aarhus University Hospital, Aarhus, Denmark

Copyright © 2018, The Authors. Published by Elsevier Inc. on behalf of the International Society for Sexual Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.esxm.2018.06.002>

(pretreatment) and, most significantly, after cancer treatment.<sup>7,8,13–16</sup> These problems include erectile dysfunction (ED), reduced sexual desire, sexual pain, orgasmic problems, and ejaculatory problems.<sup>4,13,17,18</sup> Among these sexual problems, ED is most commonly studied, and while other sexual problems are less studied, they appear to be highly prevalent and bothersome to prostate cancer patients.<sup>4,11–13</sup> Despite the high prevalence rates of sexual problems among prostate cancer patients, a relatively limited number of large sample studies of Scandinavian prostate cancer patients, which both focus on sexual outcomes other than ED and differentiate results based on the most common kinds of treatments received, exist.<sup>5</sup> Such investigations are important for cultural comparisons and comparison of sexual outcomes across common treatment groups.

Sex life satisfaction and overall assessments of problems related to sexual functioning are less studied among prostate cancer patients compared with the vast and extensive research focuses on specific sexual problems, dysfunctions, and quality of life more generally.<sup>5,19–21</sup> While there is reason to believe that sexual functioning, sex life satisfaction, and sexual problems are inter-related,<sup>7,22–25</sup> according to the definition of the World Health Organization (WHO), sexual health includes not only *the absence* of sexual problems but also *the presence* of physiological, emotional, psychological, and social well-being in regard to sexuality.<sup>16,26</sup> Therefore, where the study of more general and specific sexual functioning problems may primarily target the *absence* dimension of the WHO definition, sex life satisfaction may be seen as targeting the *presence* dimension of the definition. This double focus also seems highly relevant in studies involving prostate cancer patients and sexuality.<sup>25,27</sup>

Among prostate cancer patients, data on sexual problems and associated evaluative responses usually do not differentiate between those who self-identify as sexually active and those who self-identify as non-sexually active prior to diagnosis and treatment.<sup>5,17</sup> Subgroup-specific knowledge about sexuality following diagnosis and treatment may help provide more informed and precise sexual intervention strategies and discussions among health care providers and policy makers.<sup>19,28,29</sup> Accordingly, as most prostate cancer treatments either directly or indirectly influence various aspects of sexuality,<sup>20</sup> specific knowledge about sexuality regarding the large (sub)group of prostate cancer patients who self-identify as sexually active prior to treatment may be particularly clinically relevant and important.

Sociodemographic variables (eg, gender, age, relationship status, and educational level) have been found to be associated with various sexuality-related outcomes, including sexual problems and bothers.<sup>16,25,30,31</sup> Furthermore, among prostatic cancer patients, the time since diagnosis has been found to be associated with these outcomes.<sup>6,12,17</sup> Thus, employing analytic strategies that consider these factors is important when studying sexual problems among prostate cancer patients.

Based on a large Scandinavian (ie, Denmark, Norway, and Sweden) cohort of prostate cancer patients aged 40 years and

older who self-identified as sexually active prior to receiving a diagnosis of prostate cancer, the current study investigated self-reported problems related to erectile functioning, orgasmic ability, and the overall ability to function sexually. Furthermore, among this cohort, this study also investigated overall satisfaction with one's sex life.

## METHODS

### Participants

This study was part of a larger study of Scandinavian prostate cancer patients conducted by the Scandinavian prostate cancer patient advocate organizations.<sup>5</sup> A total of 6,916 respondents answered the questionnaire, and 6,200 of these questionnaires contained valid responses (89.7%). Given our study aims, from this sample, we selected all respondents who were 40 years of age or older and who self-identified as sexually active prior to their formal prostate cancer diagnosis, for a total of 1,713 respondents. From this group, 6 respondents were excluded because they were the only patients who received chemotherapy, resulting in a total cohort of 1,707 respondents. The mean age of the participants was 72.6 years (SD = 7.1), with a mean of 6.1 years (SD = 4.6) since the time of diagnosis. Sample characteristics (by treatment group) are presented in [Table 1](#).

### Procedure

A mixed recruitment procedure was utilized across Scandinavian countries (ie, Denmark, Norway, and Sweden) to maximize the sample size. Respondents were recruited through: (a) online banners on the web site homepages of the Scandinavian prostate cancer patient advocate organizations, (b) e-mails (when known) sent directly to members of the Scandinavian prostate cancer patient advocate organizations, and (c) paper versions of the questionnaire made available during nationally organized prostate cancer patient meetings. A professional Danish agency for public communication was responsible for all questionnaire distribution and collection. Following Danish rules for ethical approval, this retrospective anonymous study was exempt from institutional review board approval.

Respondents were invited to complete an 84-item questionnaire related to living a life with prostate cancer. The questionnaire covered patient socio-demographic data, experiences with health care services, diagnosis and treatments, side effects, and sexuality. The inclusion criteria was to have received a formal diagnosis of prostate cancer. Respondents who answered fewer than 20% of the questions and duplicates were removed from the study.

### Measures

#### Sociodemographics

The collected sociodemographic items included: (a) country of birth (Denmark, Norway, or Sweden); (b) age (year of birth); (c)

**Table 1.** Sociodemographic variables and time since prostate cancer diagnosis by treatment group

Variable	Horm*	No treatment*	RAD*	RP*	Total	Missing
Number of respondents	869 (50.9%)	92 (5.4%)	225 (13.2%)	521 (30.5%)	1,707	
Age, y (SD)	73.6 (7.3)	76.8 (7.8)	74.0 (5.9)	69.6 (6.1)	72.6 (7.1)	0 (0%)
Time since diagnosis, y (SD)	6.3 (5.0)	5.7 (4.8)	6.3 (4.0)	5.6 (4.1)	6.1 (4.6)	83 (4.8%)
Work, n (%)						65 (4%)
Not working	59 (7%)	7 (8%)	11 (5%)	48 (10%)	125 (8%)	
Retired	720 (86%)	77 (88%)	202 (93%)	369 (74%)	1,368 (83%)	
Working	58 (7%)	4 (5%)	5 (2%)	82 (16%)	149 (9%)	
Educational level, n (%)						205 (12%)
Low	120 (16%)	17 (23%)	39 (20%)	81 (18%)	257 (17%)	
Medium	517 (67%)	47 (63%)	126 (63%)	294 (64%)	984 (66%)	
High	133 (17%)	11 (15%)	34 (17%)	83 (18%)	261 (17%)	
Relationship status, n (%)						22 (1%)
Married <sup>†</sup>	724 (85%)	66 (75%)	178 (80%)	438 (85%)	1,406 (83%)	
Other	132 (15%)	23 (26%)	44 (20%)	80 (15%)	279 (17%)	
Have children, n (%)						11 (1%)
Yes	778 (90%)	81 (88%)	201 (89%)	469 (90%)	1,529 (90%)	
No	82 (10%)	11 (12%)	24 (11%)	50 (10%)	167 (10%)	

Horm = hormonal treatment; RAD = radio-therapy; RP = prostatectomy.

\*Treatment following diagnosis of prostate cancer—see also the “Statistics” section in the article for more details.

<sup>†</sup>Including co-habiting respondents.

formal education (grouped into low, medium, and high levels of education); (d) employment status (not working, retired, and working); (e) relationship status (married, divorced, single, widowed, other; dichotomized into married/co-habiting and other); and (f) parental status (have children, do not have children).

### Prostate Cancer Diagnosis and Treatments

Respondents were asked: (a) if they had been formally diagnosed with prostate cancer (yes, no, do not know), (b) when they had received their prostate cancer diagnosis (year and month), and (c) what treatments they had received for prostate cancer.

Following Fosså et al<sup>5</sup> in 2016, the respondents were grouped based on their total treatment burden in the following manner.

#### Group 1

The radical prostatectomy—only group included respondents who reported to have undergone radical prostatectomy but never received hormonal treatment, as well as respondents who reported undergoing postoperative radiation therapy, as their pattern of adverse events did not differ significantly from those who reported undergoing radical prostatectomy but not postoperative radiation therapy.<sup>6</sup>

#### Group 2

The radio-therapy-only group included respondents who reported radiation therapy only and had never received hormonal treatment.

#### Group 3

The hormone treatment group comprised respondents who previously had been exposed to androgen deprivation therapy or who were currently undergoing androgen deprivation therapy. Data for the calculation of treatment-free interval durations were not available.

#### Group 4

The group receiving no prostatic cancer treatment included respondents without any treatment following their prostate cancer diagnosis. No distinction between active surveillance and watchful waiting was made.

### Sexuality-Related Variables

To identify the respondents who were sexually active prior to treatment onset, respondents were asked to respond to the following statement: “I was no longer sexually active when starting my treatment (agree, disagree, do not know).” Problems related to erectile functioning, orgasm, and sexual functioning were assessed with the following 3 questions using the same stem. “Have you experienced problems related to your ability to (a) gain an erection, (b) orgasm, or (c) function sexually?” For these 3 questions, the response options were “yes,” “no,” and “do not know.” Self-perceived satisfaction with one’s sex life was assessed using the following question: “Do you agree or disagree with the following statement about your sex life: Following my treatment for prostate cancer, I have been satisfied with my sex life (completely disagree, disagree, neither/nor, agree, completely agree).”

**Table 2.** Sexual problems and sexual satisfaction by treatment group ( $N_{total} = 1,707$ )

Variable	Horm,* n (%)	No treatment,* n (%)	RAD,* n (%)	RP,* n (%)	Total, n (%)	Missing n (%)
Erectile problems						72 (4%)
Agree	734 (89%)	58 (69%)	179 (84%)	471 (92%)	1,442 (88%)	
Disagree	36 (4%)	12 (14%)	25 (12%)	25 (5%)	98 (6%)	
Don't know	57 (7%)	14 (17%)	8 (4%)	16 (3%)	95 (6%)	
Orgasm problems						93 (5%)
Agree	657 (81%)	50 (61%)	167 (78%)	364 (72%)	1,238 (77%)	
Disagree	68 (8%)	12 (15%)	32 (15%)	114 (22%)	226 (14%)	
Don't know	87 (11%)	20 (24%)	14 (7%)	29 (6%)	150 (9%)	
Problems in sexual functioning						87 (5%)
Agree	706 (86%)	54 (64%)	167 (80%)	430 (84%)	1,357 (84%)	
Disagree	37 (5%)	16 (19%)	27 (13%)	45 (9%)	125 (8%)	
Don't know	75 (9%)	15 (18%)	14 (7%)	34 (7%)	138 (9%)	
Sexual problems composite <sup>†</sup>						113 (7%)
Yes	723 (90%)	60 (74%)	180 (87%)	475 (94%)	1,438 (90%)	
No	79 (10%)	21 (26%)	26 (13%)	30 (6%)	156 (10%)	
Satisfied with sex life						75 (4%)
Completely agree	23 (3%)	1 (1%)	7 (3%)	14 (3%)	45 (3%)	
Agree	64 (8%)	11 (13%)	22 (10%)	45 (9%)	142 (9%)	
Neither/nor	152 (18%)	24 (29%)	39 (18%)	87 (17%)	302 (19%)	
Disagree	236 (28%)	14 (17%)	69 (33%)	148 (29%)	467 (29%)	
Completely disagree	281 (34%)	22 (27%)	64 (30%)	192 (38%)	559 (34%)	
Don't know	75 (9%)	11 (13%)	10 (5%)	21 (4%)	117 (7%)	

Horm = hormonal treatment; RAD = radio-therapy; RP = prostatectomy.

\*Treatment following diagnosis of prostate cancer—see also the “Statistics” section in the article for more details.

<sup>†</sup>Composite variable where “Yes” = problems with any 1 or more of the following: (a) erectile functioning, (b) orgasm, (c) self-perceived overall sexual functioning.

For the logistic regression analyses, the 3 items with the same stem (ie, items assessing problems related to erectile, orgasmic, and overall sexual functioning) were used to create a “no sexual problems” composite variable following correlational and factor analyses. The correlational analyses showed inter-item correlations of  $r = 0.46$ – $0.60$ . Using principal axis factoring, the scree plot and Kaiser-Guttman rule both indicated that only 1 factor should be extracted. This factor was found to explain 67.1% of the variance of the first extracted factor, indicating the appropriateness of the composite variable.

## Statistics

Sociodemographic data were summarized using frequencies or means and SD (as appropriate), stratified by treatment groups. Associations between baseline data and the “sexual problems” composite variable, as well as the “satisfaction with the sex life” variable, were addressed using logistic regression analyses. Missing data were imputed prior to analysis using chained equations, as implemented in the mice statistical package in R ([www.R-project.org](http://www.R-project.org)). For the sexual function outcome measure, the response option of “do not know” was treated as a missing variable and imputed.

Prevalence data for sexual problems and sexual satisfaction were summarized using frequencies and stratified by treatment group (Table 2).

For the sexual problems composite variable, outcomes were dichotomized (0 = no sexual problems and 1 = 1 or more sexual problem). Hence, Table 3 shows the odds ratios for reporting no sexual problems. For the “satisfaction with my sex life” variable, outcomes were also dichotomized (0 = completely disagree, disagree, neither/nor; 1 = agree, completely agree). Analyses were based on the imputed data using 15 imputations. All analyses were performed using R, Version 3.3.1.

## RESULTS

For treatment group distributions, sociodemographic variables, and time since diagnosis, please see Table 1.

Table 2 presents the data for problems related to erectile function, orgasm, and sexual functioning and for respondents' satisfaction with their sex life following treatment. Sexual satisfaction data for the no treatment group are presented for comparison, although the question of sexual satisfaction targeted sexual satisfaction following the treatment intervention. As shown in the table, across the treatment groups, a clear majority of men diagnosed with prostate cancer experienced sexual problems and decreased sexual functioning following treatment. Specifically, 69–92% of men reported erectile problems, 61–81% reported orgasm problems, and 74–94% reported at least 1 sexual problem or problem related to sexual functioning. Furthermore, across treatment groups,

**Table 3.** Odds ratios and 95% CI for sexual problems and satisfaction with sex life

Variable	No sexual problems	Satisfaction with sex life
Treatment group		
Horm (reference)*	1	1
No treatment*	3.75 (1.75–8.05) <sup>†</sup>	1.17 (0.61–2.25)
RAD*	2.91 (1.55–5.47) <sup>†</sup>	1.24 (0.79–1.94)
RP*	0.90 (1.55–5.47) <sup>†</sup>	1.21 (0.84–1.75)
Work		
Not working (reference)	1	1
Retired	1.24 (0.38–4.00)	0.66 (0.36–1.23)
Working	1.95 (0.50–7.58)	0.56 (0.24–1.31)
Education		
Low (reference)	1	1
Medium	1.24 (0.56–2.72)	0.60 (0.38–0.94) <sup>‡</sup>
High	1.55 (0.67–3.62)	0.65 (0.37–1.14)
Relationship status		
Married/co-habiting (reference)	1	1
No	1.44 (0.76–2.72)	1.30 (0.86–1.97)
Have children		
Yes (reference)	1	1
No	0.71 (0.27–1.86)	1.16 (0.69–1.95)
Age	1.03 (0.98–1.07)	1.05 (1.02–1.08) <sup>†</sup>
Time since diagnosis	1.00 (0.99–1.00)	1.00 (0.99–1.00) <sup>§</sup>

Each cell presents odds ratio with 95% CI in parentheses.

Horm = hormonal treatment; RAD = radio-therapy; RP = prostatectomy.

\*Treatment following diagnosis of prostate cancer—please see also the “Statistics” section in the article for more details.

<sup>†</sup> $P < .05$ .

<sup>‡</sup> $P < .01$ .

<sup>§</sup> $P < .001$ .

only a minority of respondents (<15%) reported being satisfied with their sexual life, including the respondents who had not received any kind of treatment following their diagnosis.

As shown in Table 3, after age, education, time since diagnosis, and civil, employment, and parental status were controlled for, the group of patients who did not receive any prostatic cancer treatments or radio-therapy treatment was significantly more likely than the hormonal treatment reference group to report no sexual functioning problems. No significant differences between treatment groups were found for satisfaction with sex life. However, older age and longer time since diagnosis were found to be significantly correlated with increased satisfaction with the sex life ( $P < .01$ ).

## DISCUSSION

In line with previous research, this study showed a high prevalence of sexual problems among prostate cancer patients who were sexually active prior to cancer treatment onset.

Specifically, this study found that the prevalence of ED, orgasmic problems, and problems related to sexual functioning ranged from 72–92% across prostate cancer treatment groups. In comparison, for the group of patients who had not received prostate cancer treatment, this range was 61–69%. These findings indicate that, while sexual problems may be common in this cohort, men who were sexually active prior to prostate cancer treatment and receive prostate cancer treatment experience high rates of sexual problems following treatment.<sup>4,6,32</sup> These results, involving a large Scandinavian sample, corroborate existing literature in the area involving samples from other cultural backgrounds and are likely an effect of the prostate cancer treatments themselves and/or their adverse side effects, such as fatigue, urinary and bowel problems, and reduced psychological well-being.<sup>12,17,20,32</sup>

Generally, the prevalence of sexual problems found in this study is somewhat elevated compared to the prevalence reported in other studies involving prostate cancer patients.<sup>6,11,14,15,32,33</sup> This discrepancy is likely due to an age effect, as sexual problems generally increase with age,<sup>19,24,34</sup> and the mean age of the respondents in this study was relatively high. Nevertheless, when controlling for a variety of variables including age, the group of patients who did not receive any prostate cancer treatment was 3.75 times more likely than the reference group to report having no sexual function problems. Although the study design does not allow for causal inferences, this result indicates a direct effect of the prostate cancer treatments on the sexual outcomes studied, extending beyond the effects of age or the other sociodemographic factors for which we controlled.<sup>4,5,7,8</sup>

A high proportion of respondents reported dissatisfaction with their sex life following prostate cancer treatment. This result may be due to the orgasmic or erectile problems evaluated,<sup>20</sup> more general adverse treatment effects influencing sexuality,<sup>5–7</sup> partner-related issues,<sup>35,36</sup> or other sexual problems not measured here but often reported by prostate cancer patients following treatment, including reduced sexual desire, lower sexual interest, and sexually related pain.<sup>8,9,18,22</sup> Moreover, it may also be an effect of the cohort studied as it includes only men, who were sexually active prior to diagnoses. Hence, for this cohort sexual problems following treatment may be perceived as more dissatisfactory as compared to men, who were not sexually active prior to diagnosis and for whom sexuality may play a different and perhaps less important role throughout the diagnostic and treatment process.

When evaluating the results, the following factors should be considered. First and foremost, to keep the questionnaire as short as possible,<sup>5</sup> the sexual outcomes studied here were assessed using non-validated crude indicators. While such indicators are not unusual in sexual research, they may adversely affect the reliability and validity of the study results or fail to adequately capture the complexity of the outcomes studied. For example, “orgasmic dysfunction” is an umbrella term that covers different problems, including painful orgasm (dysorgasmia), urinary

leakage during orgasm (climacturia), delayed orgasm (retarded ejaculation), and absence of orgasm (anorgasmia),<sup>18,37</sup> which were not separately considered in this study. This limitation may be related to the sexual outcomes studied and/or the key factors that may indirectly influence these outcomes (eg, levels of fatigue, psychological well-being, quality of life, and age). Similarly, this study did not differentiate between different kinds of ED,<sup>38</sup> which may have influenced the prevalence results of the study. Second, the study used a self-selected sample, which may not be representative of sexually active prostate cancer patients at large.<sup>12,17,20,32</sup> Third, although the results were stratified by prostate cancer treatments, additional subgroup stratifications may further improve the accuracy of the results.<sup>12,17</sup> For example, the type and method of surgery related to radical prostatectomy have been found to influence the prevalence of ED among prostate cancer patients.<sup>39</sup>

## CONCLUSION

Despite these limitations, using a large sample of Scandinavian men, this study underscores a strong clinical need to address the possibility of sexual problems and reduced sexual satisfaction among prostate cancer patients who are sexually active prior to treatment onset, even when these patients are relatively old. For health care personnel targeting the sexual rehabilitation of patients, this process may include providing information, concrete advice, and specific suggestions; following the PLISSIT model<sup>39</sup>; a penile and sexual health and well-being program<sup>40</sup>; as well as addressing solo and partnered sexual activity and satisfaction.<sup>20,21,31</sup> In this connection, as different kinds of treatments strategies of prostate cancer are associated with different patterns of adverse effects over time (eg, urinary incontinence, bowel problems, and sexual dysfunctions)<sup>41</sup> when promoting treatment decisions that incorporate sexual health and rehabilitation, these needs to be co-considered. For researchers, similar studies including cohorts of younger men, probability samples, and more differentiated outcome measures would further help to extend and qualify the study findings.

## ACKNOWLEDGEMENT

We thank the prostate cancer patient advocate organizations in Denmark (PROPA), Norway (PROFO), and Sweden (PCF) for distributing the questionnaire to their members.

**Corresponding Author:** Gert Martin Hald, PhD, Department of Public Health, University of Copenhagen, Øster Farimagsgade 5A, Building 5.1.01, Copenhagen K. 1153, Denmark. Tel: 4528731317; E-mail: [gertmartinhald@gmail.com](mailto:gertmartinhald@gmail.com)

*Conflict of Interest:* The authors report no conflicts of interest.

*Funding:* This work was supported by Astellas Nordic and the Carlsberg Foundation Distinguished Associate Professor Fellowship (Dr Martin Hald) under grant no. CF16-0094.

## STATEMENT OF AUTHORSHIP

### Category 1

- (a) **Conception and Design**  
Gert Martin Hald; Mie Dahl Pind; Theis Lange
- (b) **Acquisition of Data**  
Michael Borre
- (c) **Analysis and Interpretation of Data**  
Gert Martin Hald; Theis Lange

### Category 2

- (a) **Drafting the Article**  
Gert Martin Hald; Theis Lange
- (b) **Revising It for Intellectual Content**  
Gert Martin Hald; Mie Dahl Pind; Michael Borre; Theis Lange

### Category 3

- (a) **Final Approval of the Completed Article**  
Gert Martin Hald; Mie Dahl Pind; Michael Borre; Theis Lange

## REFERENCES

1. US Cancer Statistics Working Group. United States cancer statistics: 1999-2013 incidence and mortality web-based reports. US Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2016.
2. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2017. *CA Cancer J Clin* 2017;67:7-30.
3. Ferlay J, Soerjomataram I, Dikshit R, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer* 2015;136:E359-E386.
4. Saitz TR, Serefoglu EC, Trost LW, et al. The pre-treatment prevalence and types of sexual dysfunction among patients diagnosed with prostate cancer. *Andrology* 2013;1:859-863.
5. Fosså SD, Bengtsson T, Borre M, et al. Reduction of quality of life in prostate cancer patients: experience among 6200 men in the Scandinavian countries. *Scand J Urol* 2016;50:330-337.
6. Resnick MJ, Koyama T, Fan KH, et al. Long-term functional outcomes after treatment for localized prostate cancer. *N Engl J Med* 2013;368:436-445.
7. Stensvold A, Dahl AA, Brennhovd B, et al. Bother problems in prostate cancer patients after curative treatment. *Urol Oncol Semin Orig Invest* 2013;31:1067-1078.
8. Steinsvik EAS, Axcrone K, Dahl AA, et al. Can sexual bother after radical prostatectomy be predicted preoperatively? Findings from a prospective national study of the relation between sexual function, activity and bother. *BJU Int* 2012;109:1366-1374.
9. Kyrdalen AE, Dahl AA, Hernes E, et al. A national study of adverse effects and global quality of life among candidates for curative treatment for prostate cancer. *BJU Int* 2013;111:221-232.
10. Kelović VL, Buković D, Badzek S, et al. Sex or surgery—erectile dysfunction after radical treatment of localized prostate cancer. *Coll Antropol* 2009;33:529-532.

11. Ruiz-Aragón J, Márquez-Peláez S, Luque Romero LG. Erectile dysfunction in patients with prostate cancer who have undergone surgery: systematic review of literature [in Spanish]. *Actas Urol Esp* 2010;34:677-685.
12. Wassersug RJ, Westle A, Dowsett GW. Men's sexual and relational adaptations to erectile dysfunction after prostate cancer treatment. *Int J Sex Health* 2017;29:69-79.
13. Elliott S, Matthew A. Sexual recovery following prostate cancer: recommendations from 2 established Canadian sexual rehabilitation clinics. *Sex Med Rev* 2018;6:279-294.
14. Salonia A, Adaiyan G, Buvat J, et al. Sexual rehabilitation after treatment for prostate cancer—part I: recommendations from the fourth international consultation for sexual medicine (ICSM 2015). *J Sex Med* 2017;14:285-296.
15. Liu C, Lopez DS, Chen M, et al. Penile rehabilitation therapy following radical prostatectomy: a meta-analysis. *J Sex Med* 2017;14:1496-1503.
16. Greenberg JM, Smith KP, Kim TY, et al. Sex and quality of life. In: IsHak WW, ed. *The textbook of sexual medicine*. Cham: Springer International Publishing; 2017. p. 539-572.
17. Mulhall JP. *Sexual function in the prostate cancer patient*. New York, NY: Humana Press; 2009.
18. Matsushita K, Tal R, Mulhall JP. The evolution of orgasmic pain (dysorgasmia) following radical prostatectomy. *J Sex Med* 2012;9:1454-1458.
19. Bacon CG, Mittleman MA, Kawachi I, et al. Sexual function in men older than 50 years of age: results from the health professionals follow-up study. *Ann Intern Med* 2003;139:161-168.
20. Fode M, Serefoglu EC, Albersen M, et al. Sexuality following radical prostatectomy: is restoration of erectile function enough? *Sex Med Rev* 2017;5:110-119.
21. Mulhall JP. *Saving your sex life: a guide for men with prostate cancer*. Potomac, MD: C-I-ACT Inc; 2010.
22. Fwu CW, Kirkali Z, McVary KT, et al. Cross-sectional and longitudinal associations of sexual function with lower urinary tract symptoms in men with benign prostatic hyperplasia. *J Urol* 2015;193:231-238.
23. Donovan KA, Gonzales BD, Nelson AM, et al. Effect of androgen deprivation therapy on sexual function and bother in men with prostate cancer: a controlled comparison. *Psychooncology* 2018;27:316-324.
24. Lee DM, Nazroo J, O'Connor DB, et al. Sexual health and well-being among older men and women in England: findings from the English longitudinal study of ageing. *Arch Sex Behav* 2016;45:133-144.
25. Flynn KE, Lin L, Bruner DW, et al. Sexual satisfaction and the importance of sexual health to quality of life throughout the life course of US adults. *J Sex Med* 2016;13:1642-1650.
26. WHO. *Sexual health, human rights and the law*. Geneva, Switzerland: WHO Press; 2015.
27. Flynn KE, Lin L, Weinfurt KP. Sexual function and satisfaction among heterosexual and sexual minority US adults: a cross-sectional survey. *PLOS One* 2017;12:e0174981.
28. Heiman JR. Sexual dysfunction: overview of prevalence, etiological factors, and treatments. *J Sex Res* 2002;39:73-78.
29. Rothwell PM. Treating individuals 2. Subgroup analysis in randomized controlled trials: importance, indications, and interpretation. *Lancet* 2005;365:176-186.
30. McCabe MP, Sharlip ID, Lewis R, et al. Risk factors for sexual dysfunction among women and men: a consensus statement from the fourth international consultation on sexual medicine 2015. *J Sex Med* 2016;13:153-167.
31. Dominguez LJ, Barbagallo M. Ageing and sexuality. *Eur Geriatr Med* 2016;7:512-518.
32. Lehto US, Tenhola H, Taari K, et al. Patients' perceptions of the negative effects following different prostate cancer treatments and the impact on psychological well-being: a nationwide survey. *Br J Cancer* 2017;116:864-873.
33. Schover LR. Sexual healing in patients with prostate cancer on hormone therapy. *Am Soc Clin Oncol Educ Book* 2015:e562-e566.
34. Shamloul R, Ghanem H. Erectile dysfunction. *Lancet* 2013;381:153-165.
35. Robertson J, McNamee P, Molloy G, et al. Couple-based psychosexual support following prostate cancer surgery: results of a feasibility pilot randomized control trial. *J Sex Med* 2016;13:1233-1242.
36. Wittmann D, Koontz BF. Evidence supporting couple-based interventions for the recovery of sexual intimacy after prostate cancer treatment. *Curr Sex Health Rep* 2017;9:32-41.
37. Dubbelman Y, Wildhagen M, Schröder F, et al. Orgasmic dysfunction after open radical prostatectomy: clinical correlates and prognostic factors. *J Sex Med* 2010;7:1216-1223.
38. Lewis RW, Fugl-Meyer KS, Corona G, et al. Definitions/epidemiology/risk factors for sexual dysfunction. *J Sex Med* 2010;7:1598-1607.
39. Annon JS. The PLISSIT model: a proposed conceptual scheme for the behavioral treatment of sexual problems. *J Sex Educ Ther* 1976;2:1-15.
40. Annon Haahr MK, Azawi NH, Andersen LG, et al. A retrospective study of erectile function and use of erectile aids in prostate cancer patients after radical prostatectomy in Denmark. *Sex Med* 2017;5:e156-e162.
41. Chen RC, Basak R, Meyer AM, et al. Association between choice of radical prostatectomy, external beam radio-therapy, brachytherapy, or active surveillance and patient-reported quality of life among men with localized prostate cancer. *JAMA* 2017;317:1141-1150.