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Health-Related Quality of Life, Psychological Distress, and Sexual Changes Following Prostate Cancer: A Comparison of Gay and Bisexual Men With Heterosexual Men

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ABSTRACT

Introduction: Decrements in health-related quality of life (HRQOL) and sexual difficulties are a recognized consequence of prostate cancer (PCa) treatment. However little is known about the experience of gay and bisexual (GB) men.

Aim: HRQOL and psychosexual predictors of HRQOL were examined in GB and heterosexual men with PCa to inform targeted health information and support.

Method: One hundred twenty-four GB and 225 heterosexual men with PCa completed a range of validated psychosexual instruments.

Main outcome measure: Functional Assessment of Cancer Therapy — Prostate (FACT-P) was used to measure HRQOL, with validated psychosexual measures, and demographic and treatment variables used as predictors.

Results: GB men were significantly younger (64.25 years) than heterosexual men (71.54 years), less likely to be in an ongoing relationship, and more likely to have casual sexual partners. Compared with age-matched population norms, participants in both groups reported significantly lower sexual functioning and HRQOL, increased psychological distress, disruptions to dyadic sexual communication, and lower masculine self-esteem, sexual confidence, and sexual intimacy. In comparison with heterosexual men, GB men reported significantly lower HRQOL ($P = .046$), masculine self-esteem ($P < .001$), and satisfaction with treatment ($P = .013$); higher psychological distress ($P = .005$), cancer related distress ($P < .001$) and ejaculatory concern ($P < .001$); and higher sexual functioning ($P < .001$) and sexual confidence ($P = .001$). In regression analysis, psychological distress, cancer-related distress, masculine self-esteem, and satisfaction with treatment were predictors of HRQOL for GB men ($R^2_{Adj} = .804$); psychological distress and sexual confidence were predictors for heterosexual men ($R^2_{Adj} = .690$).

Conclusion: These findings confirm differences between GB and heterosexual men in the impact of PCa on HRQOL across a range of domains, suggesting there is a need for GB targeted PCa information and support, to address the concerns of this "hidden population" in PCa care.

Key Words: Prostate Cancer; Health-Related Quality of Life; Gay and Bisexual Men; Erectile Dysfunction; Psychosexual Predictors

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INTRODUCTION

Advances in preventative screening and cancer treatments have led to a decrease in prostate cancer (PCa) mortality rates over the past 2 decades, with 5-year survival rates in Australia currently standing at 90%.[1] This has led to an interest in health-related quality of life (HRQOL) of men treated for PCa, with prospective population-based cohort studies[2,3] reporting persistently lowered HRQOL compared with age-matched healthy populations. Decreased sexual functioning has been reported to be the most prevalent reduction in HRQOL 3 years after diagnosis,[4] with erectile dysfunction reported by 77% of men treated with radical prostatectomy.[2] PCa treatments also have been associated with loss of libido, penile shortening, nonejaculatory orgasms, or decreased orgasmic sensation, as well as bowel and urinary incontinence.[5] These sexual changes have been associated with anxiety and depression,[6] challenges to masculine self-esteem,[7] and disruptions to sexual intimacy,[8] sexual confidence,[7] and dyadic relationship communication.[9]

Until recently, research examining HRQOL and sexual functioning after PCa has focused on heterosexual men. This has resulted in gay and bisexual (GB) men, conservatively estimated to make up 3% to 5% of PCa survivors,[10] being described as an "invisible diversity,"[11] or a "hidden population."[12] There have been appeals for health providers to acknowledge that GB men may experience PCa differently from heterosexual men, necessitating targeted information and support.[12,13] However, recent reviews of PCa educational resources report an absence of such targeted support,[14,15] leading to calls for research to inform its future development.

There is some evidence that gay men report different impact of PCa on HRQOL than heterosexual men, manifested in significantly greater disruptions to sexual,[16] urinary, bowel and mental functioning,[17,18] greater sexual and ejaculatory bother[19] and fear of PCa recurrence,[17] as well as lower masculine self-esteem and less affection from partners.[18] However, at the same time, it has also been reported that GB men experience better sexual functioning,[17] or that there are no differences in sexual functioning between GB and heterosexual men with PCa.[18] Previous research in this field has been limited by comparing GB men to population norms, rather than a comparative sample of heterosexual men,[17,20] or utilizing small samples of GB men, thus precluding statistical analysis.[16,21] The 1 published study that compared 96 GB and 460 heterosexual men with PCa[19] focused on diagnostic and treatment differences between the 2 groups, as well as sexual functioning, sexual bother, and depression, rather than HRQOL.

AIMS

Further research is needed to examine HRQOL and psychosexual predictors of HRQOL in GB men in comparison with heterosexual men using validated psychosocial questionnaires[17] to evaluate these discrepancies in the research literature, and to inform targeted health information and support. This is the aim of the present study. The research questions were: Are there differences between GB and heterosexual men in HRQOL, sexual functioning, sexual confidence, psychological and cancer-related distress, masculine self-esteem, sexual intimacy, and sexual communication? What are the psychosexual predictors of HRQOL in GB and heterosexual men? How do levels of HRQOL compare with norms or other matched samples?

METHODS

Participants and Recruitment

Participants were recruited as part of a larger mixed methods program of research examining HRQOL and sexual wellbeing after PCa in GB men and their partners, in comparison with heterosexual men. The inclusion criterion was diagnosis of PCa; there were no additional exclusion criteria. Due to difficulties in recruiting this hard-to-reach population,[17] a range of recruitment strategies were adopted simultaneously. The majority of GB men with PCa were recruited through distribution of an information sheet by collaborating urology and general practice clinicians, PCa cancer support groups, and GB community organizations. An advertisement for the study and link to the information sheet also was posted on GB social media and on electronic listservs targeting PCa survivors. The heterosexual comparison sample and a small proportion of the gay sample were recruited through a distribution of the information sheet to PCa survivors on cancer research volunteer databases. Given the broad nature of recruitment, it is not possible to ascertain how many men received the information sheet or read the advertisement, in order to calculate response rate.

Ethical approval for the study was granted by Western Sydney University Human Research Ethics Committee, with free and informed consent obtained from all participants.

MAIN OUTCOME MEASURES

Demographic and Medical Information

Participants completed a questionnaire about socio-demographics and medical history.

Functional Assessment of Cancer Therapy — Prostate (FACT-P)[22]

The Fact-P measures HRQOL in men with PCa. It consists of the FACT—G (general), a 27-item self-report questionnaire that measures general HRQOL in people with cancer across 4 subscales: social, physical, emotional, and day-to-day wellbeing, as well as an additional 12-item HRQOL subscale that measures concerns specific to PCa. The combination of the 5 subscales makes up the FACT-P. Items are scored on a five point Likert scale with higher scores indicating better quality of life. In the present study, excellent internal consistency was found for the FACT-P total score in both samples ($\alpha = 0.92$ respectively).

Brief Symptom Inventory-18 (BSI-18)[23]

The BSI-18 is an18-item measure of psychological distress comprising anxiety, depression, and somatization subscales, as well

as a global severity index (GSI). Levels of distress during the past week are rated on a 5-point Likert scale, with higher scores indicating greater distress. In the present study, Cronbach's alpha was high in both samples within each subscale and the GSI ($\alpha = 0.84-0.95$).

Changes in Sexual Functioning Questionnaire (CSFQ-M)

The CSFQ-M is a 14-item measure of men's sexual functioning using a 5-point Likert scale,[24] in which higher scores indicate greater levels of reported functioning. The CSFQ-M contains 5 subscales identifying different aspects of sexual functioning: desire/frequency; desire/interest; arousal/erection; orgasm/ejaculation; and pleasure. In the current study, high alpha coefficients for total scores for both samples were found ($\alpha = 0.90$).

Dyadic Sexual Communication Scale (DSC)[25]

The DSC is a 13-item scale assessing perceptions of the communication process within sexual relationships. A 6-point Likert scale is used, with higher scores associated with better quality perceived communication. Excellent internal consistency was demonstrated in the GB ($\alpha = 0.89$) and heterosexual ($\alpha = 0.94$) samples.

Expanded Prostate Cancer Index (EPIC) — Sexual Domain[26]

The present study utilized the 13-item sexual domain questions from the Expanded Prostate Cancer Index Composite (EPIC), an instrument designed to evaluate patient function and bother after PCa treatment. The sexual domain is examined in 2 subscales: sexual function and sexual bother. In the current study, Cronbach's alpha was high for GB and heterosexual sample total scores ($\alpha = 0.92$; 0.90).

Memorial Anxiety Scale for Prostate Cancer (MAX—PC)[27]

The MAX-P is an 18-item measure of PCa-related anxiety with 3 subscales: prostate cancer anxiety, PSA anxiety, and fear of recurrence. Items are scored on a 5-point Likert scale with higher scores indicating greater PCa-related anxiety. In the present study, excellent Cronbach alpha coefficients of 0.92 were found in both samples for the MAX-PC total score.

Sexual Intimacy, Sexual Confidence and Masculine Self-Esteem

A subset of the Prostate Cancer-Related Quality of Life Scales (PCaQoL Scales)[25] were used to measure 3 key behavioral, emotional, and interpersonal aspects of life affected by PCa: sexual intimacy, sexual confidence, and masculine self-esteem. In the current study, Cronbach's alpha were acceptable to excellent across the 3 subscales in both samples ($\alpha = 0.75-0.92$).

Across the whole survey, items for GB and heterosexual participants were equivalent, with the exception of terms such as "male partner(s)" or "female partner(s)", and "intercourse" or "anal intercourse", within each survey.

Procedure

Participants responded to the request for volunteers by completing an online survey and a consent form.

Statistical Analysis

GB and heterosexual samples were compared on each of the sociodemographic and cancer characteristic variables of interest. A 1-way ANOVA was conducted with sexual orientation as the grouping variable for age, with the χ^2 test for independence used with frequency data. One-sample t tests were conducted on the mean scores for criterion and predictor variables to assess differences between the GB and heterosexual samples and published norms or other appropriate comparison sample means. Preliminary analyses for multiple regression analyses included independent sample t tests to assess group differences in mean scores on the criterion HRQOL and all potential predictor variables, and Pearson's correlations to assess associations between the criterion and predictor variables for GB and heterosexual samples. Finally, to evaluate the relationship between the set of potential predictor variables and the criterion, and identify those variables responsible for the variation in the criterion, standard multiple linear regression analyses were conducted for the GB and heterosexual samples. Exact alpha levels are reported for all statistical tests, with table notations indicating significance at the 0.05, 0.01, or greater than 0.001 levels where relevant. Ninety-five percent confidence intervals (CI) are reported for effect sizes involving principal outcomes.

RESULTS

Study Sample Characteristics

In total, 124 GB and 225 heterosexual men who have, or have had, PCa were recruited, the majority from within Australia, with a minority recruited from the United States and the United Kingdom. Table 1 presents demographics and cancer characteristics for both samples. GB men compared with heterosexual men were significantly younger (GB 64.25 years; heterosexual 71.54 years), more likely to have completed a university degree (GB 57%; heterosexual 33%), and less likely to nominate an Anglo-Celtic ancestry (GB 68%; heterosexual 88%). The relationship profile of the GB sample differed significantly from the heterosexual sample: GB men were less likely to be partnered (GB 50%; heterosexual 86%), less likely to report a current relationship of more than 2-year duration if partnered (GB 81%; heterosexual 93%), and more likely to have casual sexual partners (GB 40%; heterosexual 4%). Disease status did not differ between the GB and heterosexual samples, with the majority reporting that their cancer was no longer detectable or in remission. GB men (29%) were less likely to have undergone a radical prostatectomy than heterosexual men (38%), but more likely to have undergone a robotic prostatectomy (GB 18%; heterosexual 8%), with both samples reporting similar rates of receiving multiple treatments (GB 29%; heterosexual 24%).

Table 1. Sociodemographic and Cancer Characteristics of GB and Heterosexual Men With PCa

	GB		Heterosexual		Test for group difference		
Variable	*n*	*M (SD)*	*n*	*M (SD)*	*F*	*P*	η^2
Age	119	64.25 (8.18)	224	71.54 (8.98)	55.20	<.001	0.14
Time since first diagnosis (y)	115	5.904 (5.03)	213	7.746 (6.81)	6.489	.01	0.02
	n	%	*n*	%	χ^2	*P*	ϕ
Ethnicity							
Anglo-Celtic	84	67.74	198	88.00	20.999	<.001	0.192
Other*,†	40	32.26	25	11.11			
Employment Status							
Fulltime/Part-time	46	37.71	53	23.77	13.32	.001	0.196
Retired/Pension/Social security	62	50.82	157	70.40			
Other	14	11.48	13	5.83			
Education							
High School	28	22.95	79	35.75	17.23	<.001	0.224
Tertiary diploma or trade certificate	25	20.49	68	30.76			
University degree or higher	69	56.55	74	33.48			
Relationship status							
Partnered (living/not living together)	60	49.59	175	86.21	51.03	<.001	−0.40
Other status/No partner	61	50.41	28	13.79			
Length of current relationship							
Less than 2 years	13	18.84	13	7.18	7.29	0.01	.171
More than 2 years	56	81.16	168	92.818			
Current casual sexual relationship							
Yes	49	39.84	8	3.65	74.250	<.001	0.466
No	74	60.16	211	96.35			
Status of disease							
No longer detectable	83	68.60	159	71.62	0.62	0.73	0.04
Receiving treatment	36	29.75	61	27.48			
Other‡	2	1.65	2	0.90			
Treatment received							
Active surveillance	12	10.26	18	8.37	15.16	0.019	0.214
Radical prostatectomy	35	29.06	82	38.14			
Robotic prostatectomy	21	17.95	18	8.37			
Radiotherapy	15	11.97	37	17.21			
Androgen ablation	2	1.71	1	0.47			
Hormone therapy	0	0	7	3.26			
Multiple treatments received	34	29.05	52	24.19			

*"Other" includes African-American, South-American, South-East Asian, Middle East, each less than 2.4%.
†"Other" includes: Australian Aboriginal less than 0.4%.
‡"Other" includes receiving palliative care or not specified.

HRQOL, Psychological and Cancer Distress, Relational, Sexuality and Masculine Self-esteem Measures According to Sexual Orientation

For the outcome variable HRQOL, GB men reported significantly lower total FACT-P scores than heterosexual men, with this pattern observed for the "emotional" and "day-to-day" subscales (see Table 2). Both the GB sample and heterosexual samples reported significantly lower levels of HRQOL in comparison with a post-treatment PCa sample[28] ($M = 125.1$, $SD = 20.3$), $t(118) = -5.61$, $P < .001$, and $t(209) = -4.33$, $P < .001$, respectively.

GB men reported significantly higher total psychological distress than men in the heterosexual sample, with higher

Table 2. Comparisons on All Variables for GB and Heterosexual Men

	GB	Heterosexual	Test for group difference			
Variable	*M (SD)*	*M (SD)*	*t (df)*	*P*	95% CI	η^2
QoL (FACT-P)						
Social	18.20 (5.99)	19.32 (5.71)	−1.69 (335)	.091	[−2.42-0.18]	.008
Physical	23.91 (4.46)	24.42 (4.18)	−1.06 (339)	.289	[−1.46-0.44]	.003
Emotional	17.07 (4.48)	18.33 (4.04)	−2.58 (230.21)	.010	[−2.23 to −0.30]	.028
Day-to-day	19.99 (6.02)	21.94 (5.90)	−2.91 (344)	.004	[−3.26 to −0.63]	.024
Additional	34.52 (7.27)	34.20 (7.55)	0.38 (343)	.702	[−1.32-1.96]	.000
Total	113.96 (21.67)	118.82 (20.99)	−1.99 (327)	.046	[−9.65 to −0.07]	.012
Psychological distress (BSI-18)						
Somatization	2.81 (4.12)	2.30 (3.41)	1.19 (216.82)	.23	[−0.34-1.37]	.007
Depression	4.65 (5.40)	2.71 (4.40)	3.41 (214.44)	.001	[0.82-3.05]	.052
Anxiety	1.95 (2.58)	1.25 (2.20)	2.56 (222.38)	.01	[0.16-1.24]	.029
Panic	1.27 (2.34)	0.73 (1.88)	2.20 (211.88)	.03	[0.06-1.02]	.022
Total	10.68 (12.41)	6.98 (10.39)	2.81 (219.10)	.005	[1.10-6.28]	.034
Cancer-related distress (MAX-PC)						
Prostate Cancer Anxiety	8.45 (7.64)	5.34 (6.56)	3.81 (221.07)	<.001	[1.50-4.72]	.062
PSA Anxiety	1.02 (1.83)	0.27 (0.91)	4.29 (154.38)	<.001	[0.41-1.11]	.107
Fear of Recurrence	4.29 (3.08)	3.32 (2.88)	2.91 (344)	.004	[0.31-1.62]	.024
Total	13.59 (10.56)	8.92 (8.94)	4.15 (216.76)	<.001	[2.45-6.90]	.073
Sexual functioning (CSFQ-14-M)						
Pleasure	1.74 (1.24)	1.05 (1.17)	5.15 (343)	<.001	[0.43-0.96]	.002
Sexual Desire/frequency	4.40 (1.97)	2.63 (2.22)	7.59 (271.80)	<.001	[1.31-2.23]	.175
Sexual desire/interest	7.82 (3.12)	5.43 (3.22)	6.66 (343)	<.001	[1.69-3.10]	.115
Arousal/erection	3.87 (4.13)	1.93 (2.88)	4.61 (184.65)	<.001	[1.11-2.77]	.103
Sexual orgasm/ejaculation	4.24 (3.31)	2.33 (2.53)	5.55 (197.45)	<.001	[1.23-2.60]	.135
Total sexual functioning	29.76 (10.84)	21.01 (9.48)	7.78 (343)	<.001	[6.54-10.97]	.150
Sexual HRQoL (EPIC)						
Function	21.15 (8.65)	16.49 (8.41)	4.90 (347)	<.001	[2.79-6.53]	.065
Bother	9.48 (5.14)	9.89 (5.21)	−0.70 (341)	.482	[−1.56-0.74]	.001
Total	29.63 (12.68)	24.45 (11.56)	3.86 (347)	<.001	[2.54-7.81]	.041
Sexual communication (DSCS)	33.31 (12.31)	32.58 (10.96)	0.44 (216)	.660	[−2.55-4.02]	.001
Masculine self-esteem (PCAQoL)	55.79 (28.41)	66.69 (24.47)	−3.54 (219.62)	<.001	[−16.95 to −4.83]	.054
Sexual intimacy (PCAQoL)	50.72 (31.01)	52.14 (30.58)	−0.41 (333)	.685	[−8.28-5.45]	<.001
Sexual confidence (PCAQoL)	47.92 (29.34)	37.56 (27.55)	3.25 (338)	.001	[4.10-16.62]	.030
Ejaculatory concern	2.62 (0.10)	1.85 (0.08)	5.99 (331)	<.001	[0.51-1.02]	.098
Satisfaction with treatment	2.53 (0.75)	2.73 (0.63)	−2.51 (206.81)	.013	[−0.37 to −0.04]	.030

depression, anxiety, and panic subscale scores. While BSI-18 caseness criteria not used to formally diagnose participants in this study, GB were more likely to meet the criteria for distress, 13.7% compared with 7.1% of the heterosexual sample (χ^2 (1, 349) = 4.07, P = .04). Psychological distress for the GB sample was higher compared with UK[29] ($t(123)$ = 2.47, $p = 0.015$) and U.S. general population norms[23] ($t(123)$ = 4.73, p <0.001). Reports of psychological distress for the heterosexual sample were higher than USA norms ($t(222)$ = 2.28, P = .024), although lower than that found in the GB sample.

Reports of total PCa-related distress were significantly higher among GB men compared with heterosexual men, although both samples failed to reach clinical thresholds[30] on the PCa anxiety (>16.5), PSA anxiety (>4.5), and fear of reoccurrence (>6) subscales.

Ratings of sexual functioning were higher for the GB sample compared with the heterosexual sample across all subscale and total scores on the CSFQ-14M. For both samples, scores failed to reach cutoffs for sexual dysfunction[24] across all domains (total sexual functioning <47; pleasure <4; sexual desire/frequency <8; sexual desire/interest <11; arousal/excitement <13; and sexual orgasm/completion <13).Total sexual function (CSFQ) and sexual HRQOL (EPIC) subscale scores were significantly higher for the GB sample compared with the heterosexual sample. Despite this difference, both samples were significantly lower in sexual HRQOL compared with age-matched controls ($t(123) = 29.30$, $P < .001$; $t(224) = 50.01$, $P < .001$, respectively).[31] On the measure of ejaculatory concern, the GB sample reported significantly more concern than the heterosexual sample.

Sexual communication scores did not differ significantly between the samples. However, both samples reported significantly lower scaled scores ($M = 64.06$, $SD = 23.67$; $M = 62.65$, $SD = 21.07$, respectively) compared with a noncancer sample population[25] ($M = 81.66$, $SD = 13.08$; $t(67) = 6.13$, $P < .001$; $t(149) = 11.05$, $P < .001$, respectively). Masculine self-esteem scores were significantly lower among the GB sample compared with the heterosexual sample, whereas sexual confidence scores were significantly higher. No difference between samples was found for reports on sexual intimacy. For both samples, masculine self-esteem ($t(120) = -9.26$, $P < .001$; $t(214) = -7.80$, $P < .001$, respectively) and sexual intimacy scores ($t(121) = -7.05$, $P < .001$; $t(212) = -8.76$, $P < .001$, respectively) were significantly lower than a non-PCa male age-matched sample,[25] as were sexual confidence scores for the heterosexual sample ($t(216) = -4.73$, $P < .001$).

The correlations between all potential predictor variables and HRQOL measures according to sexual orientation are presented in Table 3. For both samples, significant positive correlations were observed for treatment satisfaction, sexual functioning, sexual HRQOL, sexual communication, masculine self-esteem, sexual intimacy, and sexual confidence scores, whereas psychological distress, PCa-related distress, and ejaculatory concern were significantly inversely correlated with HRQOL scores. For the GB sample, higher age (≥65 years) was significantly positively correlated with HRQOL, with higher education level significantly positively correlated for the heterosexual sample.

Prediction of HRQOL

Evaluations of assumptions were satisfactory, with no outliers with a standardized residual >3, and no cases found with a Mahalanobis distance score of $P < .001$ for all analyses performed. There were no potential predictors with nonsignificant 0-order correlations (as identified in Table 3); hence, none were excluded in the regression analyses. No multicollinearity among predictors was detected with all correlation coefficients <0.90. Table 4 displays the unstandardized regression coefficients (B) and intercept, the standardized regression coefficients (β), the semipartial correlations (sr^2), R^2, adjusted R^2, R, and the confidence limits for significant semipartial coefficients. Semipartial correlation coefficients are a useful measure for interpretation, as they indicate how much each variable uniquely contributes to R^2 over and above that which can be accounted for by the other predictor variables.

Table 3. Correlations Between Predictor Variables and QoL: GBmen and Heterosexual Men With PCa

Variable	GB QoL (FACT-P)	Heterosexual QoL (FACT_P)
Age	.187*	.032
Education Level	.122	.197†
Years since diagnosis	.093	−.002
Psychological distress (BSI-18)	−.768‡	−.794‡
Cancer-related distress (MAX-PC)	−.570‡	−.520‡
Sexual functioning (CSFQ-14-M)	.389‡	.256‡
Sexual HRQoL (EPIC)	.512‡	.422‡
Sexual Communication (DSCS)	.262*	.301‡
Masculine self-esteem (PCAQoL)	.683‡	.612‡
Sexual intimacy (PCAQoL)	.636‡	.529‡
Sexual confidence (PCAQoL)	.618‡	.453‡
Ejaculatory concern	−.536‡	−.430‡
Treatment Satisfaction	.499†	.299†

*$P < .05$.
†$P < .01$.
‡$P < .001$, one-tailed.

For the GB sample, the full regression model significantly explained 84% of the variance in total HRQOL scores, $F(9, 65) = 24.78$, $P < .001$, adj$R^2 = 0.84$, 95% CI [0.79, 0.89]. Squared semipartial correlations indicate 3 variables contributed uniquely to the prediction of quality of life scores, explaining 16% of the variance. The size and direction of the relationships indicated by the observed standardized regression coefficients suggests higher levels of HRQOL for GB men is associated with higher masculine self-esteem and treatment satisfaction, and lower psychological and PCa-related distress. For the heterosexual sample, the linear combination of all predictors significantly explained 72% of the variance in total HRQOL scores, $F(9, 139) = 37.46$, $P < .001$, adj$R^2 = 0.72$, 95% CI [0.66, 0.78]. Only 2 predictors displayed significant semipartial correlations, uniquely explaining 22% of the variance in quality of life scores. Higher levels of HRQOL in heterosexual men are uniquely associated with higher sexual confidence and lower levels of psychological distress.

Table 4. Multiple Regression Predicting FACT-P Total Scores From Predictor Variables by Sample for Men With Prostate Cancer

	Gay/Bisexual			Heterosexual		
Variable	B	β	sr^2	B	β	sr^2
Age	−4.732	−.114				
Education Level				1.429	.061	
Psychological distress (BSI-18)	−.861‡	−.450	0.09	−1.287‡	−.612	0.22
Masculine Self Esteem (PCaQoL)	.170*	.216	0.02	.062	.074	
Sexual Intimacy (PCaQoL)	−.077	−.101		.013	.019	
Sexual Confidence (PCaQoL)	.072	.097		.104*	.144	0.01
Sexual Communication (DSC)	−.058	−.034		.046	.025	
Cancer-related distress (MAX-PC)	−.438†	−.219	0.03	−.136	−.059	
Sexual Functioning (CSFQ-Total)	.327	.157		.141	.064	
HRQoL: Sexual (EPIC)	.117	.066		−.003	−.002	
Ejaculatory concern	−.616	−.032		−1.023	−.059	
Satisfaction with treatment	4.549*	.176	0.02	2.768	−.086	
(Intercept)	101.667			108.538		
R^2	.841§			.716‖		
Total Adj. R^2	.804			.690		
R	.917			.846		
95% Confidence limits from 0.79 to 0.89				95% Confidence limits from 0.66 to 0.78		

*$P < .05$.
†$P < .01$.
‡$P < .001$.
§Unique variability = 0.16; shared variability = 0.68.
‖Unique variability = 0.23; shared variability = 0.49.

DISCUSSION

The findings of this study confirm previous reports that PCa is associated with reductions in HRQOL and increased psychological distress, as well as disruptions to sexual functioning, dyadic sexual communication, masculine self-esteem, sexual confidence, and sexual intimacy, compared with matched population norms. Our findings also confirm previous reports that GB men experience a different impact of PCa on HRQOL[17,18] as well as greater psychological distress[17] and ejaculatory bother,[19] lower masculine self-esteem,[18] and greater dissatisfaction with treatment.[17] Findings of higher sexual functioning and sexual confidence in GB men after PCa also confirm previous research reports.[17]

These differences between GB and heterosexual men may be interpreted in the light of previous suggestions that PCa-related sexual changes can have a different meaning for GB men,[32] associated with the materiality and discursive construction of gay sex.[33] The maintenance of erectile functioning has been reported to be of greater importance for GB men,[34] due to the significance of an erect penis in gay sex.[33,35] While vaginal penetration may be possible with a partial erection, anal sex requires a firm erection, with estimates suggesting 33% more rigidity is required.[36] Reduction in penis size and absence of ejaculation also may have greater consequences for GB men, due to gay men having a preference for partners with a large penis,[37] and the erotic and intimate significance of semen exchange during gay male sex.[38] The prostate is a pleasure centre for gay men,[12] and therefore loss of pleasure or discomfort during anal sex following PCa may be a deterrent to men engaging in the receptive role in anal intercourse.[33,39] Some GB men may change roles in anal intercourse as a means of coping with erectile difficulty.[40] However, secondary self-labeling in relation to preferences in sexual roles during anal intercourse can be an important aspect of identity for GB men,[41] and changing sexual roles is not always possible or desirable.[35,42] The relational context within which many GB men experience sexual changes after PCa also may differ from that of heterosexual men, as found in the present study, with gay men more likely be single,[43] and to engage in casual or concurrent sexual relationships if they are partnered.[44] This has implications for wellbeing and partner support,[11] as intimate partners play a major role in caring,[45] as well as for the negotiation of sexual changes, which may be more difficult with new or casual partners.[33]

If GB men are diagnosed and treated at a younger age, as reported in both the present study and previous research,[19] the consequences of PCa treatment on sexual functioning will be experienced for a longer period, with potential implications for HRQOL. It has previously been reported that that PCa-related ED has a greater impact on younger men,[46] reflected in positive association between age and HRQOL in the present study, which may also contribute to higher rates of psychological distress and lower HRQOL in GB men. Whereas PCa is recognized to have an impact on masculinity, gay men also may experience disruptions to gay identity[32,33] with implications for HRQOL and psychological well-being. This may account for the finding that masculine self-esteem was a predictor of HRQOL for GB men, but not heterosexual men, in the present study.

The results of this study and other recent studies of HRQOL in GB men with PCa have a number of implications for clinicians and researchers working in PCa care. Our findings reinforce the importance of sexuality for HRQOL after PCa treatment for all men. The significance of psychological distress as a predictor of HRQOL in both groups of men, with PCa-related distress also acting as a predictor for GB men, emphasizes the importance

of psychosocial interventions aimed at reducing psychological and cancer related distress,[47] with a long-term aim of improving HRQOL. The finding that sexual confidence was a predictor of HRQOL for heterosexual men, and masculine self-esteem was a predictor for GB men, suggests that boosting sexual confidence and masculine self-esteem should be central to such interventions.

GB men may have greater unmet needs in terms of psychological support. For although a plethora of psychological interventions have been developed for heterosexual men and couples to address PCA related concerns,[47] at present, there is an absence of GB-specific health PCa information and counseling, with a few notable exceptions.[48] It has previously been suggested that PCa health services and information have a heteronormative focus,[11] indicating that targeted support services for GB men need to be developed, and general health service providers need to be sensitive to the needs and concerns of GB men.[49] This includes awareness and inclusion of GB relational support, attention to GB-specific sexual concerns and identity issues after PCa, and avoidance of heterocentric language in consultations. Experiences of negative reactions from health professionals to disclosure of GB identity, or refusal to discuss GB-specific sexual experiences after PCa,[50,51] may contribute to greater dissatisfaction with treatment in GB men, with implications for HRQOL.

There were a number of strengths and limitations of the present study. The strengths included the use of a range of validated psychosocial instruments, the use of comparative samples of GB and heterosexual men, and the analysis of predictors of HRQOL, the first study in this field to undertake such analysis. The inclusion of gay-specific wording, such as anal sex and male partners in the GB sexual instruments is also a strength, as it addresses the criticism that such instruments exclude or overlook the sexual practices of men who have sex with men,[52] and demonstrates the acceptability of such measures for GB men with PCa. The limitations include the use of a self-selected volunteer sample completing online surveys, which may attract participants who have treatment side effects; the use of multiple methods of recruitment that did not allow for calculation of response rate; the heterogeneous and nonmatched nature of the 2 samples, and the absence of inclusion criteria other than PCa diagnosis, which leads to caution about the comparison; and the retrospective nature of data collection, which may influence recollection of experiences, combined with absence of data from clinical records, which does not allow for substantiation of information on diagnosis and treatment. Future research should ideally recruit through cancer registries or clinical contexts, and compare matched samples of GB and heterosexual men longitudinally from the point of diagnosis. However, this is difficult at present, as sexual orientation data is currently not routinely collected by cancer registries[53] and clinics focusing on GB men with PCa are rare. Matching a heterosexual sample to GB men recruited through other means is an alternative compromise. Bisexual men also made up a relatively small proportion of the sample, despite concerted efforts to recruit such men, suggesting further research is needed in this area. Future research also should examine the impact of type of treatment, and stage of cancer at diagnosis, variables not assessed in the present study. Finally, it would be useful to compare the experiences of GB men with PCa with GB men who have other types of cancer in order to elucidate factors that are specific to GB men across cancers.

In conclusion, this study adds new information and knowledge to the developing field of GB experiences of PCa. Differences observed between GB and heterosexual men in HRQOL across the psychological and sexual domains, as well as in satisfaction with treatment, suggests that GB-specific PCa information and support is needed. Routine collection of data on sexual orientation by cancer registries and clinics will facilitate targeting implementation of such support, serving to address the needs of this hitherto "invisible diversity" in the field of PCa research and care.

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