

ORIGINAL ARTICLE

The impact of hegemonic masculine ideals on self-esteem in prostate cancer patients undergoing androgen deprivation therapy (ADT) compared to ADT-naïve patients

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Funding information

Above and Beyond Bristol Charity

Abstract

Purpose: Androgen deprivation therapy (ADT) for Prostate Cancer (PCa) is associated with side effects that could lead to negative body image and low masculine self-esteem of survivors. We compared a group of PCa survivors following ADT with ADT-naïve patients, expecting the ADT group to show lower masculine self-esteem. We also expected patients with hegemonic masculinity ideals to show poorer masculine self-esteem and we hypothesized that ADT would moderate this relationship, expecting PCa patients on ADT with stronger hegemonic ideals to show the worst masculine self-esteem scores among study participants.

Methods: We compared 57 PCa survivors on ADT ($M_{age} = 64.16 (7.11)$) to 59 ADT-naïve patients ($M_{age} = 65.25 (5.50)$), on the Masculine Self-Esteem Scale (MSES), Body Image Scale (BIS), and Hegemonic Masculinity Ideals Scale (HMIS).

Results: While the two groups did not significantly differ on masculine self-esteem ($F [1, 115] = 3.46, p = 0.065, \eta_p^2 = 0.029$) and body image ($F [1, 115] = 3.46, p = 0.065, \eta_p^2 = 0.029$), younger age was significantly associated with higher body image issues ($F [1, 115] = 8.63, p < 0.01, \eta_p^2 = 0.071, \beta = -0.30$). Hegemonic masculinity significantly predicted more masculine self-esteem related issues ($t (2, 114) = 2.31, \beta = 0.375, p < 0.05$). ADT did not moderate this relationship.

Conclusions: The results suggest that endorsing hegemonic masculinity could represent a risk factor for low masculine self-esteem regardless of ADT status and that younger age is associated with negative body image among PCa survivors.

Implications: These results suggest the importance of inclusion of topics related to hegemonic masculinity when providing support to PCa survivors, both when discussing treatment side effects, as well as in the later phases of survivorship. This pilot also suggests that younger PCa survivors might benefit from body-image focused support regardless of treatment plan.

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KEYWORDS

ADT, body image, hegemonic masculinity, masculine self-esteem, prostate cancer survivorship, psycho-oncology

1 | INTRODUCTION

Prostate cancer (PCa) is the second most common cancer among men worldwide¹ and it is now the most commonly diagnosed cancer in England (www.prostatecanceruk.org). As more men are tested, PCa incidence is increasing and expected to rise to 1.7 million worldwide by 2030.² Positively, survival is also increasing in both high, low and middle income countries,³ with approximately 80% of patients living for at least 10 years after diagnosis.⁴ PCa treatment options (i.e., surgery, radiation therapy, chemotherapy, hormonal therapy) present varying success rates based on the stage of the disease^{5–7} and therapy is associated with physical and psychological side effects.^{8,9} Men diagnosed and treated for PCa can experience incontinence, fatigue, metabolic and sexual issues, changes in body composition and appearance (e.g., hair loss, loss of muscle mass, weight gain, breast enlargement), cognitive symptoms, and higher risk of depression.⁹ Therefore, PCa survivors represent an increasing proportion of cancer survivors living with long lasting treatment side effects that impact their quality of life (QoL), requiring attention from researchers and health care professionals.^{4,10}

In particular, numerous studies have shown that diagnosis and treatments of PCa is likely to negatively impact patients' masculine self-esteem,¹¹ which can be defined as the subjective assessment of one's self-worth with respect to their masculinity ideal.¹² In most cultural contexts, including western societies, 'being masculine' is still often stereotypically associated with attributes such as physical strength, sex drive, control of emotions, and ability to economically provide for the family.^{13–15} These characteristics might be considered incompatible with being ill and vulnerable, and therefore threatened by PCa diagnosis and treatment.^{14–16} Research investigating the psychological experience of men diagnosed with PCa confirms that patients can experience feelings of loss for their masculine body¹⁷ and regret for deteriorated bodily functions.¹⁸ In particular, a review by Chambers et al.¹⁹ found that in both qualitative and quantitative studies erectile dysfunction provoked by PCa treatments was linked to diminished masculine self-esteem among survivors.

Similarly, some preliminary research showed the association of PCa diagnosis and treatment with the development of negative body image, which can be defined as the negative subjective evaluation of one's body appearance and functioning.²⁰ For example, Kelly et al.¹⁷ conducted a qualitative study exploring the embodiment and personal impact of PCa with 14 men undergoing various treatments and found that participants were dealing with a sense of loss for their masculine physical appearance prior to diagnosis and for their prior levels of fitness and body functionality (i.e., everything that the body can do²¹).

Research shows that both low masculine self-esteem and negative body image are associated with psychological and physical health

risks. For example, studies found that PCa-induced reduction of masculine self-esteem is linked with negative psychological outcomes, such as distress,²² depression, embarrassment, decreased self-worth, feelings of identity loss and stigmatisation,²³ poorer QoL,¹⁹ as well as sexual and relationship issues.^{24,25} Moreover, cancer-related reduction in masculine self-esteem seems to be associated with negative physical outcomes. A longitudinal study by Hoyt et al.²⁶ found that low masculine self-esteem at baseline predicted a decline in urinary, bowel, and sexual function 3 months later. Similarly, a large body of literature in the general population highlights how body image concerns are associated with several negative mental health outcomes, such as disordered eating and unhealthy exercise patterns, heightened risk of social anxiety and depression, and also suicidal ideation.^{27,28}

1.1 | The potential impact of androgen deprivation therapy (ADT) for prostate cancer on masculine self-esteem and body image

The findings presented above highlight the need to address these issues among men diagnosed with PCa and, most importantly, to identify those patients who might be more vulnerable to cancer-related disruption of body image and masculine self-esteem. In this regard, research suggests that PCa patients following Androgen Deprivation Therapy (ADT) might experience treatment side effects that can be particularly disruptive towards both their masculine self-esteem and body image.^{29–32}

ADT is one of the primary treatments for prostate cancer and is recommended by the National Institute for Health and Care in the UK (NICE).²⁹ The European Association of Urology (EAU) guidelines advise ADT prescription both in combination with radiotherapy in patients with localised PCa and as a treatment for patients with metastatic PCa.³⁰ By reducing androgen levels with a gonadotropin releasing hormone (GnRH) agonist, ADT interrupts testosterone supplies to prostate cancer cells, preventing PCa growth. However, ADT is associated with several side-effects, including weight gain (reported by 70% of patients on ADT at some point during treatment), breast enlargement (28.6%), penile shrinkage (93%), lack of libido (58%–91%), impotence (73.3%–95%), incontinence (25%–69%), hot flushes (44%–80%), and fatigue (33%–46.8%).^{31,32}

The wide array of ADT side effects can strongly affect both patients' bodily appearance and functioning, therefore exposing PCa survivors to higher risk of dissatisfaction with appearance and functionality and, in turn, negative body image.³³ Moreover, ADT seems to affect exactly those bodily characteristics considered masculine, such as physical strength, muscularity, and sexual confidence.^{34,35}

Therefore, when compared to other treatments ADT might have a particularly negative impact on patients' masculine self-esteem.

Preliminary qualitative research has found that ADT-induced bodily changes can foster negative body image among PCa patients, as well as feelings of shame and discomfort.^{13,17} For example, Navon & Morag³⁶ interviewed 15 PCa patients undergoing ADT in Israel and found so-called 'bodily feminisation' was considered one of the main challenges associated with PCa diagnosis and ADT. Similarly, a qualitative study by (Gentili et al., 2019) found that among 22 patients diagnosed with PCa and undergoing ADT, treatment side effects such as breast enlargement, fat increase, loss of muscle mass, and sexual dysfunction, lead to experiences of body feminisation and negative body image.³⁷ In particular, men on ADT seem to identify the cause of diminished masculine self-esteem in bodily changes such as weight gain, decreased muscle mass, breast enlargement, loss of libido and erectile dysfunction, often considered 'feminising'.^{32,38,39} Some patients also report masculinity-related concerns around mood-swings and hot flushes, described as similar to menopausal symptoms.³⁹ Feelings of decreased masculine self-esteem were also associated with social isolation and decreased QoL in this group of patients.^{40,41}

Quantitative research, although limited, seems to partially confirm the findings from qualitative studies. A longitudinal study by Sharpley et al.⁴² found that ADT-related side effects such as breast changes and hot flushes predicted feelings of loss of masculinity in 1070 PCa patients over 3 years.⁴² In line with these results, quantitative studies also found ADT to be associated with sexual issues, poorer QoL, and depression.^{43–45} Similarly, a cohort study conducted by Fowler et al.⁴⁶ compared 234 PCa patients undergoing ADT to 855 PCa patients who never received ADT (i.e., ADT-naïve) in the US on several health-related outcomes and found that androgen deprived patients had significantly poorer body image scores than those men who were not. Similarly, a quantitative study by Harrington et al.³³ compared body image (measured with the Body Image Scale for cancer patients [Hopwood et al.⁴⁷]) in a group of 87 PCa patients who received ADT at least once in their life with 45 ADT-naïve patients, and found that patients who had been undergoing ADT showed significantly worse body image scores when compared to the ADT-naïve group. In line with these results, a study by Saini et al.⁴⁴ compared 49 PCa patients on ADT and 54 ADT-naïve patients, finding that ADT was associated with depression, worse QoL, and more body image issues.⁴⁴

The qualitative and quantitative findings presented so far highlight how ADT might have a negative impact on PCa patients' body image. However, results within the quantitative literature are not always consistent with this trend. For example, a longitudinal study of 74 PCa patients in the USA by Taylor-Ford⁴⁸ found that participants were satisfied with their body image prior to the start of treatment as well as at 1 month and 2 years after treatment completion, irrespective of treatment type.⁴⁸ In line with these results, a study by DeFrank et al.⁴⁹ found that 104 PCa patients expressed positive body image significantly more frequently when compared to other male and female cancer patients (diagnosed with

bladder [$n = 23$], female breast [$n = 131$], colorectal [$n = 84$], endometrial [$n = 30$], and melanoma [$n = 27$]), independently from their treatment.⁴⁹ Similarly, a quantitative pilot study by Langelier et al.⁴³ aiming to explore the association between levels of exercise and patterns of masculinity, body image, and QoL among PCa patients following different treatments found that the associations between exercise and body image did not change when tested on patients following ADT ($n = 26$) or on ADT-naïve patients ($n = 24$).⁴³ From this result, the authors draw the conclusion that negative body image and low masculine self-esteem might be an experience affecting PCa patients independently from ADT. However, it is important to notice that given the small sample size of the pilot and the lack of a direct comparison between ADT and ADT-naïve patients, these results need to be interpreted with caution.

Despite preliminary evidence suggesting that PCa patients on ADT might develop body dissatisfaction and masculine self-esteem issues and research highlighting their detrimental impact on one's health, this topic is still largely under-represented in the literature. In particular, given the qualitative nature of most of the studies investigating the negative impact of ADT and the mixed quantitative results, further quantitative investigation of the levels of masculine self-esteem and body image in men on ADT and ADT-naïve patients is needed.

1.2 | Hegemonic masculinity ideals: Another risk factor for low masculine self-esteem during PCa

Although we expect ADT to be a significant risk factor for masculine identity issues, it is important to note that the degree and type of impact the treatment will have on patients' masculine self-esteem will also depend on the specific masculinity ideals they hold.

Masculinities can be defined as gendered ways of being and being in the world that usually guide people who tend to identify as men within a socio-cultural system structured around the gender-binary (although their influence is not confined to one gender identity).⁵⁰ The term 'hegemonic masculinity' refers to a specific form of masculinity which idealizes toughness, self-sufficiency, lack of emotional sensitivity, heteronormativity, as well as physical and sexual strength.^{51,52} Whilst legitimizing a patriarchal societal structure,⁵³ hegemonic masculinity beliefs have been also associated with negative physical and psychological health outcomes, such as negative mood, poorer social well-being, poorer health behaviours, higher health risks, and medical comorbidities.^{18,19,35,54,55} Specifically, a study by Burns and Mahalik⁵⁵ found that prostate cancer patients who held hegemonic masculinity beliefs reported poorer mental health when compared to patients with less traditional masculinity views.⁵⁵

When looking at western societies specifically, the hegemonic masculinity ideal remains the most dominant and valued. However, individuals can still adopt different and multiple models of masculinities since they are manifold,¹⁶ varying both across contexts as well as within a person and can change on the basis of demographics, such as the intersections of class, race, sexuality, cultural heritage and age.⁵⁶ It is therefore possible to reject the values of domination,

physical strength, and sexual power, to embrace values such as connection to emotions, and interdependence instead.⁵⁷ Men who refuse hegemonic masculine ideals may likely be less negatively affected by ADT-side effects. In fact, the impact of ADT on features such as physical strength, sexual power and emotional control may not represent a threat to their core masculine identity. On the other hand, men holding a hegemonic ideal are likely to be impacted more negatively by hormonal treatment, as they might appraise a feminisation of their body as strongly negative and undesirable. For men with a hegemonic masculine ideal, ADT-side effects might damage those core characteristics embodying their ideal masculine identity.^{55,58} To the best of our knowledge, no study has examined the impact of ADT treatment and hegemonic masculinity ideals as well as their interaction on PCa patients' masculine self-esteem.

1.3 | Hypotheses

The present cross-sectional quantitative pilot study aimed to test the following hypotheses:

Hypothesis 1 *When comparing PCa patients who are currently on ADT with ADT-naïve patients on measures of masculine self-esteem and body image, the ADT group was expected to show significantly poorer masculine self-esteem and body image scores when controlling for age.*

Hypothesis 2 *We expected PCa patients with strongly hegemonic ideals to show poorer masculine self-esteem when controlling for age and time since diagnosis. We also expected ADT to moderate this relationship, expecting PCa patients on ADT with stronger hegemonic ideals to show the worst masculine self-esteem scores among study participants.*

2 | METHODS

2.1 | Recruitment and participants

The study was promoted via sponsored social media (Facebook) posts in several groups dedicated to prostate cancer peer support and men's health, press releases, and a variety of UK-based and international prostate cancer charities' websites and mailing lists. Participants were invited to take part in a brief survey investigating the psychological challenges that men encounter after a diagnosis of PCa. The study was advertised as 'A survey on men's health' to minimise recruitment bias related to potential participants' pre-existing levels of masculine self-esteem, hegemonic ideals, and body image issues. Men diagnosed with PCa, aged between 35 and 75 years, and without a comorbid diagnosis of dementia or psychosis were invited to participate in the online pilot study.

A power analysis run with G*Power estimated that a total minimum sample of 128 participants would be necessary in order detect

medium effect sizes (Cohen's $d = 0.5$) (which have been observed in similar studies adopting similar measures, such as⁴⁴) considering an alpha level of 0.05 and power of 80%.

Of the 312 potential participants reached by the survey, 127 men were eligible and consented to participate: 63 PCa survivors on ADT and 64 ADT-naïve PCa patients. Of these, 91.34% completed the entire survey (ADT: $n = 57$, $M_{\text{age}} (SD) = 64.16$ years (7.11); ADT-naïve: $n = 59$, $M_{\text{age}} (SD) = 65.25$ years (5.50)) (see Figure 1 for a flowchart of participants through the study).

All participants identified as cisgender men (cisgender meaning people whose gender identity matches the gender and sex assigned to them at birth, in this case male). The majority in both groups were British (56% in the ADT group and 66% in the ADT-naïve group), followed by American participants (37% in the ADT group and 22% in the ADT-naïve group). The high majority of the participants identified as White (98.2% in the ADT group and 98.3% in the ADT-naïve group) and heterosexual (91.2% in the ADT group and 96.6% in the ADT-naïve group). Most of the participants across both groups referred to being in a 'supportive romantic relationship' (ADT = 73.3%; ADT-naïve = 81.7%) and to 'live with their partner' (ADT = 71.9%; ADT-naïve = 84.7%). Participants' areas of residence equally varied between urban, suburban, and rural. The sample was overall highly educated, with the majority of participants having at least a college degree (Table 1).

An independent sample t-test revealed that the two groups did not significantly differ for age ($t(1, 114) = 0.930$, $p[2\text{-tailed}] = 0.354$). While the two groups did not statistically differ for average number of months since PCa diagnosis at the time of data collection ($t(1, 112) = -1.421$, $p[2\text{-tailed}] = 0.158$), the ADT group still showed an average time since diagnosis 12 months ($M = 40.61$, $SD = 32.19$) higher than the ADT-naïve group ($M = 52.35$, $SD = 53.41$). This difference was expected, as ADT tends to be prescribed at a later stage of prostate cancer treatment.²⁹ The two groups did not significantly differ on any other demographic variables (Table 1).

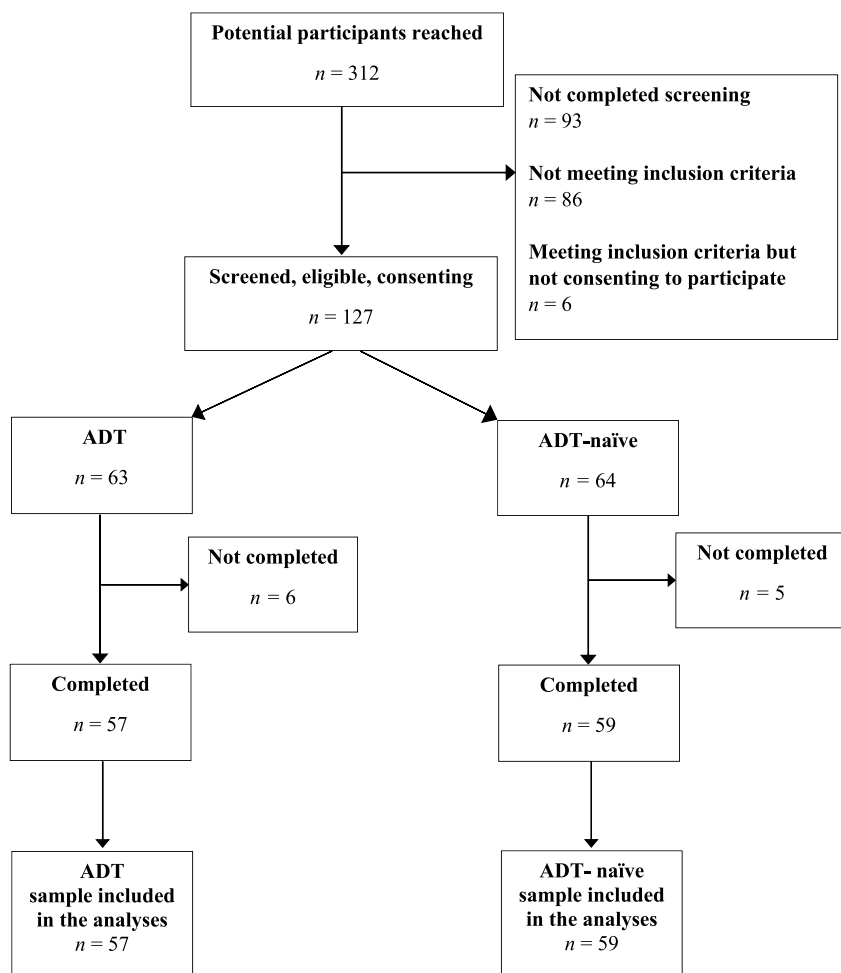
The majority of patients in the ADT group had received at least one other treatment in addition to ADT (53.3%), mostly radiotherapy (54.4%), followed by radical prostatectomy (36.8%), and chemotherapy (26.3%). Most patients in the ADT-naïve group received only one treatment (73.3%), the most frequently reported being radical prostatectomy (74.6%) (Table 1).

2.2 | Data collection

Prior to data collection, a group of three men diagnosed with PCa were invited to review and provide feedback on the study materials. The aim of this patient and public involvement (PPI)⁵⁹ was to check whether the study information and questionnaires were appropriate, that the survey would not be too burdensome for participants, and that the planned recruitment strategy was acceptable. Minor changes were made to the survey wording and visual format, following their feedback.

Once the study materials were finalized, the study was promoted (see above) and those who were interested in the study were invited

FIGURE 1 Participants' flowchart



to follow a link to a secure online survey (Qualtrics, 2021). After reading the Participant Information Sheet and providing informed consent, participants completed the screening questions to check their eligibility. Participants were then automatically directed to the study questionnaire.

Questionnaires' administration was randomized so that we could control for order effect. The survey took an average of 16.6 min to complete ($SD = 7.61$ min). Participants were offered the chance to enter a lottery for two £70 online shopping vouchers.

2.3 | Measures

Body Image Scale (BIS)⁴⁷. The BIS is a 10-item scale developed in collaboration with the European Organisation for Research and Treatment for Cancer (EORTC), which measures body image issues in cancer patients (e.g., 'Since cancer treatment/diagnosis, how much have you felt dissatisfied with your appearance?'). Participants responded using a Likert scale ranging from 0 (not at all) to 3 (very much). The global score is obtained by adding up all the item scores, with higher scores indicating more severe body image issues. The internal consistency of BIS was excellent ($\alpha = 0.916$).

Masculine Self-Esteem Scale (MSES)¹². The MSES is an 8-item questionnaire specifically developed for PCa patients, assessing the subjective evaluation of physical and mental components of masculine self-esteem (e.g., 'Since cancer treatment/diagnosis, how often do you happen to feel lacking in masculinity?') on a 5-point Likert scale (1 = never, 5 = always). MSES global score consists of the sum of all the item scores, with higher global scores representing lower masculine self-esteem and more severe psychosocial distress. The MSES presented a good internal consistency ($\alpha = 0.869$).

Hegemonic Masculinity Ideals Scale (HMIS). A literature review revealed that all the validated questionnaires focussing on masculinity norms (e.g., Conformity to Masculine Norms Inventory⁶⁰) measured respondents' adherence to stereotypically masculine personality traits (e.g., 'I tend to keep my feelings to myself'), rather than their beliefs and ideals on masculinity (regardless of their traits). Given the absence of a measure that would fit the purpose of this pilot, a measure of hegemonic masculinity ideals was developed (Table 2). Since this pilot aimed to understand whether participants' hegemonic masculine ideal might influence their masculine self-esteem when living with PCa, the measure was designed to investigate whether participants thought being masculine meant aligning with the hegemonic model of masculinity, regardless of their current personality traits. While the scale is not yet statistically validated, we strived to qualitatively ensure content

TABLE 1 Demographic data

	ADT (n = 57)	ADT-naïve (n = 59)
Age <i>M</i> (<i>SD</i>)	64.16 (7.11)	65.25 (5.50)
Nationality <i>N</i> (%)		
American	21 (37%)	13 (22%)
Australian	-	2 (3.4%)
British	32 (56%)	39 (66%)
Canadian	1 (1.75%)	2 (3.4%)
Croatian	1 (1.75%)	-
Irish	2 (3.5%)	2 (3.4%)
Italian	-	1 (1.8%)
Ethnicity		
Asian/Asian British/Asian European/Asian American	-	-
Black/Black-British/African American/African/Caribbean	-	1 (1.7%)
Multiple ethnic groups	1 (1.8%)	-
White	56 (98.2%)	58 (98.3%)
Sexual Orientation		
Bisexual	1 (1.8%)	1 (1.7%)
Heterosexual	52 (91.2%)	57 (96.6%)
Homosexual	3 (5.3%)	-
Rather not say	1 (1.8%)	1 (1.7%)
Supportive romantic relationship		
Yes	42 (73.7%)	48 (81.7%)
No	12 (21.1%)	9 (15.3%)
Rather not say	3 (5.3%)	2 (3.4%)
Living situation		
With partner	41 (71.9%)	50 (84.7%)
Alone	12 (21.1%)	7 (11.9%)
With children or relatives	3 (5.3%)	2 (3.4%)
Another living arrangement	1 (1.8%)	-
Living area		
Rural	19 (33.4%)	18 (30.5%)
Urban	19 (33.4%)	16 (27.1%)
Suburban	19 (33.4%)	25 (42.4%)
Education <i>N</i> (%)		
Vocational/technical school	5 (8.8%)	10 (16.9%)
High school equivalent	4 (7%)	7 (11.9%)
Grammar school	3 (5.3%)	6 (10.2%)
College	15 (26.3%)	8 (13.6%)
Bachelor's degree	9 (15.8%)	13 (22%)
Master's degree	12 (21.1%)	11 (18.6%)
Doctoral degree	6 (10.5%)	3 (5.1%)
Another degree	3 (5.3%)	1 (1.7%)

(Continues)

TABLE 1 (Continued)

	ADT (n = 57)	ADT-naïve (n = 59)
Time since diagnosis in months <i>M(SD)</i>	52.35 (53.41)	40.61 (32.19)
ADT duration in months <i>M(SD)</i>	33.44 (42.64)	N/A
Number of treatments		
None	-	15%
1	10%	73.3%
2	53.3%	11.7%
3	30%	-
4	6.7%	-
Treatments (other than ADT) <i>N (%)</i>		
Active surveillance	7 (12.3%)	18 (30.5%)
Brachytherapy	6 (10.5%)	5 (8.5%)
Chemotherapy	15 (26.3%)	-
External beam radiotherapy	31 (54.4%)	8 (13.6%)
Radical prostatectomy	21 (36.8%)	44 (74.6%)
Radium-223	2 (3.5%)	-
Outcome measures, <i>M(SD)</i>		
MSES (score range: 8–40)	18.17 (5.98)	16.17 (5.63)
HMIS (score range: 5–25)	14.31 (3.53)	13.56 (3.041)
BIS (score range: 0–30)	9.30 (6.85)	9.29 (7.16)

Note: The table reports the demographic and outcome variables data of the ADT and ADT-naïve participants.

Abbreviations: ADT, androgen deprivation therapy; BIS, body image scale; HMIS, Hegemonic Masculinity Ideal Scale; M, mean; MSES, Masculine Self-Esteem Scale; SD, standard deviation.

TABLE 2 Hegemonic masculinity ideals items

Directions for participants

Indicate the degree to which you agree with the following statements:

Items

I think in society being masculine means...

1. Being physically strong
2. Being sexually active
3. Being emotional (R)
4. Being vulnerable (R)
5. Dealing with problems alone

Scoring method

- 1 = disagree
- 2 = somewhat disagree
- 3 = neither agree nor disagree
- 4 = somewhat agree
- 5 = agree

masculinity in accordance to hegemonic masculinity values of competitiveness, sexual and athletic power, control and stoicism.⁶¹ The items then reviewed by the other authors as well as masculinity experts based in authors' university, to ensure the items properly mapped the theoretical content. After applying amendments, the latest version of the questionnaire was reviewed by the study's PPI group. PCa patients reviewed the items and suggested amendments to ensure that the phrasing of the measure was acceptable and easy to understand. Table 2 includes the final version of the questionnaire that was administered to participants. Participants rated the items on a 5-point Likert scale (1 = disagree, 5 = agree) and the global score was calculated by summing all the item scores. Higher global scores indicate a stronger hegemonic masculine ideal. The HMIS internal consistency for both groups was $\alpha = 0.648$.

3 | DATA ANALYSES

All the analyses were performed with SPSS28 ©. The first hypothesis was tested performing two ANOVAs with Group (ADT vs. ADT-naïve) as a fixed factor, and MSES and BIS scores as dependent variables respectively, and age and time since diagnosis as covariates. As a *first step*, the presence of Group \times Age and Group \times Time since

validity and acceptability by implementing revision rounds by field experts as well as PCa patients. The first author developed an initial version of five items investigating respondents' ideals around

Diagnosis interactions were examined. These interactions were not significant for any of the outcomes and were therefore excluded from the statistical models. As a *second* and *third step*, the analyses were re-run with Age and Time since diagnosis as covariates, excluding the interaction term. Adding Age significantly affected only BIS scores and was therefore kept in the model, while the reported results for MSES scores are based on the statistical model run without any covariate.

To test for moderation effects of ADT status on the relationship between hegemonic masculinity and masculine self-esteem, we conducted a moderated analysis with PROCESS Macro, which applies an ordinary least square path analytic framework.⁶² We ran PROCESS Macro Model 1, with HMIS scores as the independent variable, MSES scores as dependent variables, and ADT status as a dichotomous moderator (1 = ADT, 0 = ADT-naïve). As a *first step*, we ran a multiple regression with HMIS and ADT status as independent variables predicting MSES scores. As a *second step*, we tested the moderated model with PROCESS Macro including Age and Time since diagnosis as covariates. Since neither of the covariates significantly contributed to the model, they were removed and the reported results refer to the model ran without covariates (*third step*).

3.1 | Data preparation

For this pilot study we opted for a per-protocol analysis including only participants who had completed the entire survey. Of the 127 men who were eligible for the study, 91.34% completed the entire survey (ADT = 57; ADT-naïve = 59) (Figure 1). Given the result of our power calculation (see Section 2.1), the per-protocol analysis resulted to be only slightly underpowered.

The ANOVA assumptions of absence of outliers and homogeneity of variance were met for both outcome variables. The assumption of normal distribution of residuals was met for MSES scores but not for BIS scores, as they presented minor skewness (ADT group: skewness = 0.560, SE = 0.316; ADT-naïve group: skewness = 0.566, SE = 0.311). However, given the absence of outliers and the acceptable level of skewness ($-2 < \text{skewness} < +2$), the data was not transformed, given that ANOVA is robust against minor violations of normality.⁶³

The moderated regression assumptions of absence of outliers, minimum of 20 records per predictor included in the model, linear relation between independent and dependent variables, normal distribution of the residuals, absence of collinearity, and homoscedasticity, were all met.

4 | RESULTS

4.1 | Hypothesis 1

Our first hypothesis stated that when comparing a group of PCa patients following ADT with ADT-naïve men on body image and

masculine self-esteem, patients on ADT would show poorer outcomes than the ADT-naïve group.

A univariate ANOVA showed a marginally non-significant main effect of Group ($F [1, 115] = 3.46, p = 0.065, \eta_p^2 = 0.029$) on MSES scores. Participants in the ADT group showed higher scores than participants in the ADT-naïve group, indicating more frequent occurrence of masculine self-esteem issues; however this difference did not reach statistical significance (Table 1).

When looking at body image issues, a univariate ANOVA showed a non-significant main effect of Group ($F [1, 115] = 0.61, p = 0.805, \eta_p^2 = 0.001$) on BIS scores, when controlling for age ($F [1, 115] = 8.63, p < 0.01, \eta_p^2 = 0.071$). While the two groups did not significantly differ for body image issues, younger age was associated with higher BIS scores, indicating more severe negative body image ($\beta = -0.30, p < 0.01$). We therefore ran additional exploratory analysis, running two linear regressions separately for each group, with age as an independent variable and BIS score as a dependent variable. When looking at the effect of Age on BIS scores separately between groups, we found that mature Age significantly predicted lower BIS scores in the ADT-naïve group ($t (1, 58) = -2.45, \beta = -0.401, p < 0.05$), and reached marginal non-significance in the ADT group ($t (1, 56) = -1.806, \beta = -0.228, p = 0.076$) (Supporting Information S1).

4.2 | Hypothesis 2

The second hypothesis proposed that PCa patients with strongly hegemonic ideals would show poorer masculine self-esteem and that ADT would moderate this relationship, expecting PCa patients on ADT with stronger hegemonic ideals to show the worst masculine self-esteem scores among study participants.

We first ran a multiple regression analysis with HMIS scores and ADT status as independent variables predicting MSES scores. The analysis resulted in a significant model ($F (4, 113) = 2.86, p < 0.05$), with HMIS significantly predicting higher MSES scores ($t (4, 113) = 2.150, \beta = 0.363, p < 0.05$) (Figure 2) and ADT status showing a non-significant effect ($t (4, 113) = 1.46, \beta = 1.58, p = 0.148$) as did age ($t (4, 113) = -1.76, \beta = -1.51, p = 0.089$) as well as time since diagnosis ($t (4, 113) = -0.52, \beta = -0.007, p = 0.606$).

We then tested the moderation model with PROCESS macro, with HMIS scores as the independent variable, ADT status (no = 0, yes = 1) as a moderator, and age and time since diagnosis as covariates. The analysis resulted in an overall significant moderated model ($F (5, 108) = 2.55, p < 0.05$), but the interaction effect was non-significant ($t (5, 108) = 1.14, \beta = 0.39, p = 0.25$). This indicated that while HMIS significantly predicted higher MSES scores in the multiple regression, ADT did not have moderating effects on this relation. This result suggests that regardless of ADT status, higher levels of hegemonic masculine ideals were associated with more severe issues related to masculine self-esteem for all PCa patients, suggesting that HMIS might be a stronger predictor of MSES scores among PCa patients than ADT status.

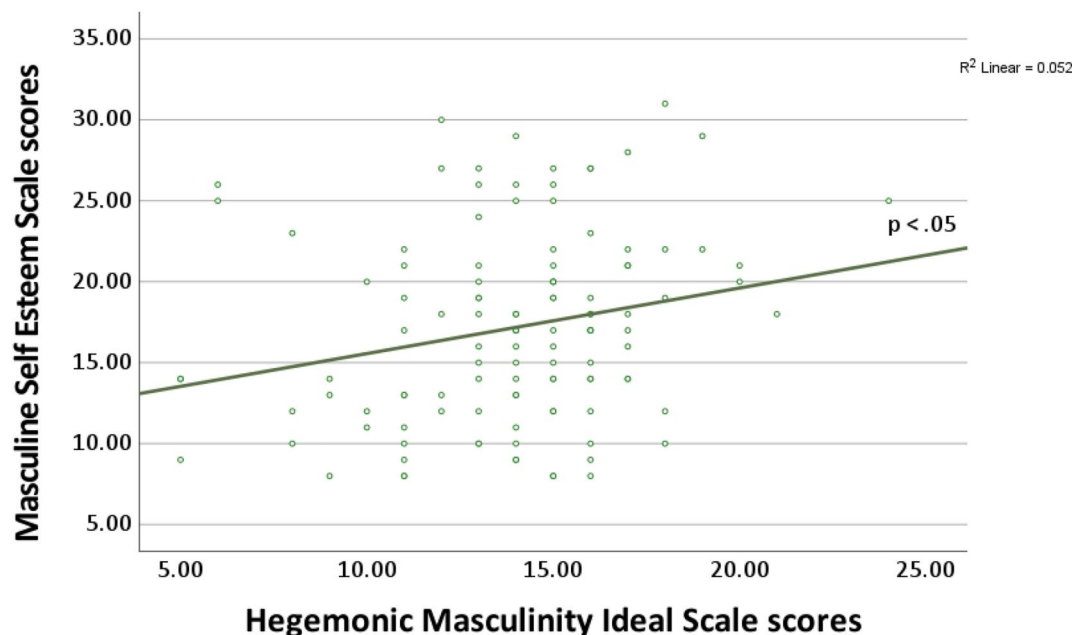


FIGURE 2 Hegemonic Masculinity Ideal Scale scores predicting Masculine Self-Esteem Scale scores in the sample altogether. HMIS, Hegemonic Masculinity Ideal Scale scores; MSES, Masculine Self Esteem Scale scores

5 | Discussion

The present study compared a group of men diagnosed with PCa and following ADT with a group of ADT-naïve PCa patients on levels of masculine self-esteem and body image issues, expecting the ADT group to show poorer scores on both outcomes. We also investigated the effect that a hegemonic masculine ideal had on patients' masculine self-esteem, expecting patients with high scores on the HMIS to present more masculine self-esteem issues. We then tested whether ADT would moderate the relationship between HMIS score and MSES scores.

Our first hypothesis stated that when comparing a group of PCa patients following ADT with ADT-naïve men on body image and masculine self-esteem, patients on ADT would show poorer outcomes than the ADT-naïve group. Our hypothesis was not confirmed, as the ADT and ADT-naïve group did not significantly differ on their reported levels of body image issues and showed a marginally non-significant difference for masculine self-esteem issues. As previously mentioned, the majority of the studies finding that patients undergoing ADT struggle with their body image tend to adopt qualitative methods (e.g., 13, 18, 38, 39), while quantitative studies present mixed findings (e.g., 45). This pattern suggests that while the ADT-induced bodily changes might foster feelings of negative body image in some men, this might not necessarily be the case for the majority of patients. These results are in line with the conclusions of the quantitative pilot by Langalier et al.,⁴³ suggesting that 'body image and masculinity issues may be universal across treatment protocols'⁴⁵ (p. 2286).

In this regard, several studies in the general population suggest that individuals identifying as men tend to be less vulnerable to body

image issues.⁶⁴ While for centuries and in several cultures, women have been experiencing strong pressures to adhere to certain beauty ideals, men have not been exposed to such aesthetic norms so systematically.^{65–67} This suggests that identifying as male could be associated with lower appearance investment,⁶⁸ which in turn could act as a protective factor against body image issues for some PCa patients, even when faced with the bodily changes induced by ADT.

However, when looking at body image issues specifically, we found that younger patients across groups were more likely to experience negative body image. This result is in line with previous literature, finding PCa patients are more vulnerable to body dissatisfaction at a younger age, when expectations around sexual performance and autonomy are higher.³⁷

Hypothesis 2 was partially confirmed by the analyses. In particular, we found that those patients with higher hegemonic masculinity ideals significantly predicted higher masculine self-esteem issues. This result indicates that patients' masculinity ideal can have a direct effect on their mental health, with hegemonic masculinity model being detrimental for patients' masculine self-esteem. To the best of our knowledge, this is the first study investigating the impact of hegemonic masculine ideal on PCa patients' masculine self-esteem. The interpretation of this result could be informed by the thin ideal internalisation model stating that those individuals holding an unattainable appearance ideal are at higher risk of body image dissatisfaction.⁶⁹ Thin ideal internalisation theory which states that the perceived discrepancy between one's actual body and the thin-beauty ideal causes dissatisfaction and might encourage individuals to engage in unhealthy behaviours aimed at minimizing the discrepancy.⁷⁰ The association between hegemonic masculine ideal and low masculine self-esteem in PCa patients could be interpreted in a

similar way. The impact of cancer treatment and diagnosis is likely to negatively impact those bodily and societal characteristics that are central to a hegemonic masculine ideal (such as being strong, muscular, sexually active, financially autonomous). As a consequence, the discrepancy between patients' ideal and real embodiment of their masculinity would increase, leading to a decrease in masculine self-esteem. On the other hand, those patients scoring low on HMIS showed higher masculine self-esteem, suggesting that different masculinity models might represent a protective factor for PCa patients.⁵⁴ Altogether, these findings highlight the need to further investigate how alternative conceptualisations of masculinity (e.g. caring masculinities) might be protective of patients' psychological wellbeing while undergoing ADT.

Lastly, we ran a moderation model with HMIS scores as independent variables, ADT status as moderator, and MSES score as a dependent variable, in order to test for the interaction between hegemonic masculine ideal and hormonal therapy. The aim of this analysis was to test whether the effects of ADT and hegemonic masculinity ideal would interact, therefore exposing those patients following ADT and holding such ideals at risk higher risk of masculine self-esteem issues. Interestingly, while in the moderation model both the independent variables had a significant effect, the interaction did not—disconfirming our hypothesis of a moderation effect. When analysing the effect of the two predictors without the interaction, hegemonic masculinity ideals showed a significant predictive effect on masculine self-esteem. Together with the lack of moderation effect, these results suggest that those patients holding a stronger hegemonic masculine ideal seem negatively affected in their masculine self-esteem regardless of their ADT status. This finding is in line with qualitative research in the field. For example, a qualitative meta-synthesis by Bowie et al.⁴¹ investing body image, self-esteem, and sense of masculinity in patients with prostate cancer highlights how side effects of PCa treatments can foster feelings of impossibility to embody a masculine identity, with its physical characteristics and abilities. The meta-synthesis highlights that patients identify PCa and its treatments as an obstacle to reaching traditionally masculine hegemonic ideals and that this, in turn, can foster feelings of loss and low self-esteem⁴¹.

Although preliminary, the results of this pilot allow us to formulate some cautious suggestions for clinical practice. While most PCa patients on ADT might be coping effectively with body image issues, younger patients might be at higher risk of developing appearance related concerns.⁷¹ Therefore, we suggest that body image issues might be particular challenges for younger PCa patients during their treatment and that support with these issues should be made routinely available to all (for example within informational materials). Similarly, the results of this pilot suggest the importance of exploring themes related to masculinity when providing support to PCa patients. It could be beneficial to facilitate discussions among peers on the changes that masculine identity goes through during the PCa treatment journey, regardless of treatment, as well as to encourage conversations on the various ways to be masculine beyond the hegemonic ideal.

5.1 | Study limitations

Having adopted a cross-sectional design means that this pilot does not provide information regarding the potential development and fluctuation over time of body image and masculine self-esteem issues in PCa survivors. While the present cross-sectional study included time since diagnosis as a covariate to the regression analyses (obtaining non-significant results) future research in the field should implement longitudinal designs from the point of diagnosis onwards. A longitudinal design would allow for a better understanding of potential cohort effects over time. For example, investigating whether hegemonic masculine ideals, masculine self-esteem, and body image concerns fluctuate only as an effect of ageing and proceeding through PCa treatment and/or whether said time trends might differ between participants belonging to different generations (i.e., cohort effects). Lastly, given the lack of consistency between qualitative and quantitative findings in the field, future research should employ not only longitudinal designs, but also mixed methods approaches for a better integration of qualitative and quantitative data⁷².

The implementation of a non-validated measure to investigate hegemonic masculine ideals represents another limitation. The HMIS was designed and implemented because of the current lack of a validated questionnaire specifically measuring hegemonic masculinity ideals (rather than traits). The questionnaire presented an internal consistency of $\alpha = 0.648$. While a Cronbach's alpha level of 0.65 is considered adequate by some,^{73,74} other scholars consider the minimum acceptable level of alpha to be 0.70.⁷⁵ It is also important to notice that Cronbach's alpha is influenced by the number of items included in a scale, with a low number of items reducing the internal reliability score.⁷³ Further quantitative validation of the HMIS is therefore warranted to determine its validity and investigate whether the Cronbach's alpha score could be improved by item modification and/or if it might be influenced by the low number of items included ($n = 5$). Despite this limitation, this is the first study to date to quantitatively explore the effect of hegemonic masculinity ideals on PCa survivors' masculine self-esteem. This scale represents a potential contribution not only to PCa psycho-oncology research, but also to gender and sociological studies. Validation of the HMIS would allow for further investigation of hegemonic masculinity ideals. For example, future studies could compare men with low engagement with hegemonic masculinity ideals to those who are highly invested in hegemonic masculinity ideals on body image and masculine self-esteem levels, as well as on psychological and physical health outcomes more broadly.

It is also important to note that while the BIS is a validated measure among cancer patients,⁴⁷ this questionnaire was not specifically validated among PCa patients,⁷⁶ meaning that some nuances related to the body image experience of this population might not be captured by the questionnaire. However, it is also important to highlight that none of the body image measures currently administered to PCa patients have been validated among this specific group of cancer patients, which represents a limitation of the broader field.⁷⁶ Therefore, the choice of BIS remains sound within the current field limitations, as it is the most frequently administered scale among PCa patients to date.⁷⁶

Moreover, the consultation of a PPI group to check for survey acceptability and appropriateness allowed us to verify in advance whether participants found BIS items relevant for them.

The majority of men who took part in the pilot were white, cis-gender, heterosexual, and highly educated. While this represents a common limitation in the psycho-oncology field,⁷⁷ it is important to note that these results are therefore only representative of a specific group of individuals which represents a study limitation. Future studies should aim to reach a more diverse sample, including more members from the LGBTQIA+ community, as well as from the Black and Asian communities, and from other racialized groups. The inclusion of PCa patients with more diverse identities to explore the impact of PCa diagnosis and treatment on masculinities intersecting with different cultural and sexual identities. This would allow researchers to produce findings that are more relevant, applicable, and impactful for a wider percentage of the PCa patients' population. In relation to this last point, it is important to highlight how future research should also aim to fill the gap of knowledge and support around the lived experience of trans and non-binary PCa patients.

Lastly, in this pilot the analyses did not control for number and intensity of ADT side effects when investigating the impact of ADT on masculine self-esteem and body image. This choice was motivated by the necessity of maintaining adequate power despite the small scale of the pilot, which would have been reduced by a high number of covariates.⁷⁸ Despite this limitation, this pilot compared two groups of PCa patients isolating the role of active ADT implementing validated masculine self-esteem and body image questionnaires, analysing a topic that has been mostly explored qualitatively.

5.2 | Clinical implications

Although preliminary, the results of this pilot allow us to formulate some cautious suggestions for clinical practice. While most PCa patients on ADT might be coping effectively with body image issues, younger patients might be at higher risk of developing appearance related concerns.⁷¹ Therefore, we suggest that body image issues might be particular challenges for younger PCa patients during their treatment and that support with these issues should be made routinely available to all (for example within informational materials). Similarly, the results of this pilot suggest the importance of exploring themes related to masculinity when providing support to PCa patients. It could be beneficial to facilitate discussions among peers on the changes that masculine identity goes through during the PCa treatment journey, regardless of treatment, as well as to encourage conversations on the various ways to be masculine beyond the hegemonic ideal.

5.3 | Conclusions

In line with the mixed quantitative findings published so far, this study found no significant differences in body image and

masculine self-esteem issues between PCa patients undergoing ADT and ADT-naïve patients, suggesting that said experiences might be affecting PCa patients irrespective of their ADT-status. However, younger age was significantly associated with higher body image issues, indicating that younger PCa survivors might benefit from body-image focused support regardless of treatment plan.

The present study expands previous literature by finding that hegemonic masculinity ideals represent a detrimental factor for PCa patients' masculine self-esteem, regardless of treatment status. These results suggest that alternative conceptualisations of masculinity (e.g., caring masculinities) might be protective of PCa patients' masculine self-esteem, opening new research avenues.

AUTHOR CONTRIBUTIONS

The first author, Dr Gentili, led the study conceptualisation and design, to which all authors contributed. Material preparation, data collection and analysis were performed by Dr Gentili and was supported by all authors. The first draft of the manuscript was written by Dr Gentili and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

ACKNOWLEDGEMENTS

This research was funded by Above & Beyond Bristol Charity (Bristol, UK).

CONFLICT OF INTEREST

The authors have no relevant financial or non-financial interests to disclose.

DATA AVAILABILITY STATEMENT

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

ETHICS STATEMENT

The Research Ethics Committee of the Faculty of Health and Applied Sciences at The University of the West of England (Bristol, UK) granted approval for the execution of this observational study: UWE REC REF No.: HAS.18.01.080.

SUBMISSION DECLARATION

This manuscript has not been published previously, it is not under consideration for publication elsewhere, its publication is approved by all authors and by the responsible authorities where the work has been carried out. If accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright holder.

CONSENT TO PARTICIPATE

Informed consent was obtained from all individual participants included in the study.

CONSENT TO PUBLISH

The authors affirm that human research participants provided informed consent for publication of the study data.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Gentili C, McClean S, McGeagh L, Bahl A, Persad R, Harcourt D. The impact of hegemonic masculine ideals on self-esteem in prostate cancer patients undergoing androgen deprivation therapy (ADT) compared to ADT-naïve patients. *Psychooncology*. 2022;31(11):1958-1971. <https://doi.org/10.1002/pon.6001>