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**Manuscript title:** Investigating the Psychological Impact of Active Surveillance or Active Treatment in Newly Diagnosed Favorable-Risk Prostate Cancer Patients: A 9 month Longitudinal Study

**Running title:** The psychological impact of active surveillance or active treatment

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**Abstract**

Objective

This study aimed to explore the psychological impact of favorable-risk prostate cancer (PCa) and associated treatment (Active Surveillance (AS) or Active Treatment (AT)), comparing prevalence and temporal variability of generalized anxiety, PCa-specific anxiety, and depression symptoms.

Methods

PCa patients were recruited at diagnosis prior to treatment decision-making and completed questionnaires assessing anxiety (STAI-6; MAX-PC) and depression symptoms (CES-D) at four timepoints for 9-months. Non-cancer controls were recruited via university staff lists and community groups. Results were analyzed using analysis of variance.

Results

Fifty-four PCa (AS n=11, AT n=43) and fifty-three non-cancer participants were recruited. The main effect of time or treatment group were not statistically significant for CES-D scores ($p>0.05$). The main effect of treatment on STAI-6 scores was significant ($F(2,73)=4.678$, $p=0.012$) with AS patients reporting highest STAI-6 scores (T1 M=36.56; T2 M=36.89, T3 M=38.46; T4 M=38.89). There was a significant main effect for time since diagnosis on MAX-PC ($F(3,123)=3.68$, $p=0.01$), AS patient scored higher than AT at all timepoints (T1 M=10.33 v 10.78; T2 M=11.11 v 11.30; T3 M=13.44 v 10.55; T4 M=11.33 v 8.88), however both groups declined overall with time.

Conclusions

Men undergoing AS had significantly higher anxiety symptoms than AT and non-cancer participants, contradicting previous literature. This may be due to perceived inactivity of AS relative to traditional narratives of cancer treatment. Participant experiences appear to be less favorable relative to other international centers. Recommendations for future research and clinical practice include the need to improve diagnosis and treatment information provision particularly for lower-risk patients.

Keywords

Active Surveillance; Cancer; Expectant Management; Longitudinal Research; Oncology; Prostatectomy; Prostatic Neoplasms; Psychological Adjustment; Radiotherapy; Surveys

## Background

Prostate cancer (PCa) is the most common male cancer worldwide,[1] with data from the UK Office for National Statistics[2] indicating a three-fold increase in the incidence of PCa in Britain over the last 30 years, although a decline in PCa mortality has also been observed. A ~70% increase in the incidence of 'favorable-risk' PCa (i.e. Gleason score ≤7, PSA <20ng/mL and clinical stage T1-T2b[3]) has been observed[4] attributed to the sensitivity of screening measures which can lead to overtreatment.[5] The risk-benefit of treating low-to-intermediate PCa can be challenging for patients to understand,[6] especially when treatment can result in permanent and life-changing complications (e.g. impotence and incontinence[7]) without any proven disease modifying benefit.

There is a high potential over-treatment of lower risk PCa and subsequent possible side-effects for men diagnosed with this type and stage of cancer.[8] Evidence from a post-mortem study of men who died from a cause other than PCa, found that 40% of men over 60 years, and 60% of men over 80 years had evidence of PCa.[9] The majority of the PCa cases diagnosed post-mortem were considered low-to-intermediate risk, supporting the phrase commonly used in the field that men with low-to-intermediate risk PCa are more likely to die 'with PCa than from PCa'.

Active surveillance (AS) was developed in response to the increasing numbers of men diagnosed with favorable-risk disease to avoid the potential side effects of curative treatments until the cancer progresses further. The current study is based on the UK's National Institute for Health and Care Excellence (NICE) guidelines which recommend that AS should consist of regular PSA tests, Digital Rectal Examinations (DRE), annual or biannual biopsies.[3]

Three systematic reviews have been conducted on the psychological impact of lower risk PCa and AS,[10–12] each demonstrating that the majority of evidence concludes that AS patients demonstrate minimal psychological harm, supporting the assumption of many that lower risk disease equates to lower risk of psychological morbidity. However, despite the high quality of the reviews, the methodological limitations of the included studies, such as a lack of appropriate comparison/control groups, and unavailability of baseline data gathered prior to treatment decision-making, leading to the risk of selection bias[12], suggest the need for further research. To our knowledge, this paper is the first to report on this baseline timepoint of a prospective, longitudinal study thereby allowing us to capture more accurately the psychological impact of a diagnosis of favorable-risk PCa.

The aim of this study was to provide an indication of the psychological impact of favorable-risk PCa and its associated treatment plans, comparing the prevalence and temporal variability of generalized anxiety, PCa-specific anxiety (PCa patients only), and depression symptoms among men newly diagnosed with favorable-risk PCa, eligible for all treatment options including active surveillance (AS), and age-matched men not diagnosed with cancer.

## Methods

### *Procedures*

Two participant groups were included in this study: men diagnosed with favorable-risk PCa and a cohort of age-matched men with no cancer diagnosis. The group of men diagnosed with PCa was further subdivided into those who opted immediately for AT despite eligibility for AS, and those who chose to undergo AS. Process of follow up is illustrated in Figure 1.

PCa participants: Men eligible for AS but have not yet made their treatment decision, i.e. newly diagnosed with favorable-risk PCa, as defined by NICE (Gleason score ≤7, PSA <20 ng/mL, clinical stage T1-T2b[3]. Participants were recruited in the regional Cancer Centre and outpatient Urology department of an academic hospital in Belfast, Northern Ireland between February and September 2016 during their diagnosis/treatment discussion appointment.

Comparison between peers with no cancer and men diagnosed with favorable-risk PCa was considered important to facilitate understanding of the overarching impact of screening, biopsy receipt, diagnosis of PCa, as well as variability in psychological and physical wellbeing associated with the ageing process more generally.[13] Non-cancer control participants were recruited using a combination of peer-nomination[14–16] and advertising to local men's and retirement groups and university staff list. Eligible men were >55 years old, were not diagnosed with any form of cancer, or other condition that may have affected their emotional wellbeing (as self-reported by participants).

Both participant groups completed questionnaires at their leisure and returned questionnaires using pre-paid return envelope. The researcher was not present for questionnaire completion, however contact direct telephone and email was provided should participants have queries regarding any aspect of the study including the questionnaire.

Full details of sample and recruitment are available elsewhere.[13] Ethical approval was granted by ORECNI (15/NI/0210) and NHS R&D office (15093SP-SS). All participants provided written informed consent prior to participation.

The sample size was calculated using GPower software (2007), effect size and sample size was calculated based on mean score and standard deviation on the State-Trait Anxiety Inventory short form (STAI-6)[17] in two populations; data from a population of men diagnosed with low-to-intermediate risk PCa, prior to treatment[18] and men of a similar age group from the general population.[19] At 0.8 power, p value 0.05, and an effect size of 0.503, the required sample size was 50 participants per group, 10% was added to this, resulting in a final sample size of 55 PCa patients, and 55 non-cancer controls.

This was considered exploratory work therefore p values were not adjusted for multiplicity.[20] Rather, exact p values are reported where possible, to allow the reader to make their own judgements about statistical significance.

*Measures used*

Men with PCa were invited to complete outcomes at four timepoints (pre-treatment decisionmaking, 3, 6 and 9 months post decision). Non-cancer participants completed questionnaires at equivalent times (Figure 1).

Symptoms of generalized anxiety (STAI-6[17]), PCa-specific anxiety (Memorial Anxiety Scale for Prostate Cancer; MAX-PC[21]), and depression (Centre for Epidemiologic Studies Depression Scale; CES-D[22]) were the primary outcomes of the study. All scales used have been utilized previously in cancer populations[13,23,24]. Clinical and socio-demographic were collected (e.g. age, disease profile, ethnicity, education, employment, relationship, sexual orientation).

STAI-6 scores can range from 20 to 80, and a score ≥44 was considered clinically significant[17]. Internal consistency was high (Cronbach's $\alpha$= 0.79), as was concurrent validity with longer forms of the scale ($r>0.9$),[17] MAX-PC possible scores range from 0 to 54 and patients with scores of ≥27 were considered clinically significant[21]. MAX-PC total scores showed high internal consistency (Cronbach's $\alpha$=0.89), test-retest reliability ($r$=0.26-0.68), and construct validity when correlated with HADS total scores (r=0.52) and HADS Anxiety Subscale ($r$ =0.57).[21] For the CES-D, scores could range from 0-60, scores were considered clinically significant when participants scored ≥16. For all three scales higher scores indicated higher psychological distress. CES-D has shown high internal consistency (Cronbach's $\alpha$=0.85-0.9), test-retest reliability ($r$=0.45-0.70), and construct validity with SF-36 Mental Health Summary Scale ($r$=0.65).[22]

Self-rated quality of life (QoL) was measured using the visual analogue scale (VAS) tool from EQ-5D[25]. Participants were asked to self-rate current health status on a visual scale of 0-100, with 100 representing the 'best health you can imagine'.

PCa knowledge was assessed using a scale developed by van den Bergh, et al.[23] Possible score range was 0 to 15, a score of 15 indicated maximum PCa knowledge. Although the PCa knowledge scale was initially developed in Dutch, the scale was translated into English using forward-backward translation.

Involvement of the clinician in decision-making was also assessed using an item developed by van den Bergh, et al.[26]("Who had the major part [i.e. who had the most influence] in the choice for your chosen treatment: you or your clinician?"), with 5 possible response options, resulting in a score range of 1-5, with 1 representing that the treatment decision was that of the patient and 5 representing that the treatment decision was that of the clinician.

*Statistical analysis*

Participant demographic characteristics were summarized descriptively. Generalized anxiety and depression scores were analyzed using a (4)x3 MANOVA with the within-subjects factor of time since diagnosis (baseline, T1; 3months, T2; 6months, T3, 9months, T4) and the between-subjects factor of participant type (AS, AT, non-cancer). PCa-specific anxiety scores were analyzed using a (4)x2 mixed-ANOVA with the within-subjects factor of time since diagnosis (baseline, T1; 3months, T2; 6months, T3, 9months, T4) and the between-subjects factor of participant type (AS, AT). Post-hoc tests have only been included where the MANOVA or ANOVA demonstrated a statistically significant result. Based on mixed ANOVA protocol, participants were excluded from the analysis if data was missing at any one time-point. The ANOVA for PCa-specific anxiety was not included in the MANOVA as it only examined the difference between two groups, whereas for generalized anxiety and depression three groups were included.

**Results**

Of the 91 eligible PCa patients approached during their outpatient clinic appointment, 54 returned completed questionnaires (response rate, 59%). Advertising through community groups and university staff distribution lists were the most effective non-cancer recruitment method as only one non-cancer participant was recruited using peer-nomination. Sixty-five men expressed an interest in participating in the study following advertising, of whom 52

returned questionnaires (response rate, 80%). This resulted in a total of 53 non-cancer participants. Retention rates remained high (>80%) throughout Time 2 to Time 4 (3-9 months) in both participant groups (Figure 2). Reasons for PCa non-participation at Time 1 are listed in Table S1 (Supplementary Material).

Participant demographic characteristics are reported in Table 1. The PCa sample was predominantly white, married/in a significant relationship, and heterosexual. Mean age was AS: 64.9 years (SD, 5.79); AT: 62.2 years (SD, 6.58); and non-cancer: 61.8 years (SD, 5.90).

Most PCa participants (77.8%, 43/54) opted for AT despite being eligible for AS[3]. Of those 43 men who underwent AT, 15 opted for external beam radiotherapy (34.88%), 11 for brachytherapy (25.58%), 15 for radical prostatectomy (34.88%), 2 did not specify type of AT (4.65%). The clinician appeared to have a greater role in the treatment decision-making of AS patients compared to AT patients, with 55.5% (n= 5) AS patients reporting that their clinician made the biggest contribution to treatment decision-making, compared to 27.8% (n=10) AT patients. Conversely, most AT patients felt they made the biggest contribution (38.9%, n=14) compared to 11.1% (n=1) of AS patients. A third of both AS (n=3) and AT patients (n=12) reported that decision-making was equal between patient and clinician.

Summary scores for CES-D, STAI-6, and MAX-PC are reported in Table 2. Patients who continued on to AS and AT patients had relatively similar STAI-6 and CES-D scores at baseline, however MAX-PC scores were significantly higher in AS patients. The MAX-PC scale focuses on PCa symptom burden and progression, factors that AS patients likely had to consider when making their treatment decision. From T2 on, AS patients reported consistently higher scores in generalized anxiety, PCa-specific anxiety, and depression relative to AT patients. Non-cancer controls had the lowest reported psychological scores that stayed low and stable throughout follow-up.

No AS participants switched to AT over the course of the 9 month follow-up.

Based on chi-square analysis, the PCa and non-cancer samples were well matched in terms of ethnicity ($t(53)=0.991$, $p=0.324$), sexual orientation ($t(51)=1.352$, $p=0.182$), relationship ($t(101)=0.331$, $p=0.741$), employment status ($t(103)=0.643$, $p=0.522$), and age ($t(103)=0.757$, $p=0.451$). However, significantly higher numbers of the non-cancer population reported third-level education ($t(95.17)=6.248$, $p<0.001$), likely a result of the sampling/recruitment strategy adopted.

Analysis of variance (independent samples t-test) indicated that there was no statistically significant difference in the anxiety reported by PCa responders and PCa non-responders on the 1-item anxiety scale (t(5.45)=-1.019, p=0.351).

ANOVA showed that there was no statistically significant difference in baseline self-reported QoL between the three participant groups (AS, AT, non-cancer (EQ-5D-5L VAS; $F(2,102)=1.45$, p=0.239)). There was also no statistically significant differences between baseline PCa knowledge in men who later opted for AS (M, 11.27, SD, 1.90) compared to AT patients (M, 10.79, SD, 2.96; t(52)=0.512, p=0.611). Therefore, neither physical symptom experience nor knowledge differential is likely to have influenced the reported differences in psychological wellbeing between groups.

*Generalized Anxiety and Depression*

A mixed (4x3) MANOVA for the combined outcomes of STAI-6 and CES-D swas conducted. The main effect of time (F (6,68) = 0.893, p = 0.505) and the interaction between time and group (F (6,69) = 1.588, p = 0.164) were not statistically significant. However, the main effect of group was statistically significant (F (2,73) = 4.678, p = .012). To further explore the significant main effect of group the outcome measures were examined separately and it was found that the multivariate significant effect arose from significant differences between groups in terms of STAI-6 scores (F (2,73) = 4.450, p = .015) but not CES-D scores (F (2,73) = 2.241, p = .114).

Post hoc Tukey tests for the main effect of group on STAI-6 found that the non-cancer group scored significantly lower than the AS group (p =0.039) but not the AT group (p=0.064). There was no significant difference between the AS and AT groups (p=0.614).

*PCa-specific Anxiety*

In the mixed ANOVA for MAX-PC, Mauchly's test was not significant therefore sphericity assumed values were interpreted. There was a statistically significant main effect for time since diagnosis on MAX-PC scores; $F(3,123)=3.68$, p=0.014. The main effect of treatment type (AS, AT) was not statistically significant; $F(1,41)=3.92$, p=0.054. The interaction between time since diagnosis and treatment type was also not statistically significant; $F(3,123)=0.135$, p=0.939. AS patient scores were higher than AT at all timepoints, however both groups' scores generally declined steadily between T1-T3, with scores remaining stable between T3 and T4.

**Conclusions**

Results of the present study suggest that treatment type (i.e. AS or AT) has a significant impact on psychological wellbeing up to 9 months post-diagnosis of favorable-risk PCa. The extent of this impact varies over time, however AS patients consistently reported higher scores on measures assessing anxiety and depression symptoms.

This paper is, to our knowledge, the first to report on the crucial post-diagnosis but pre-treatment decision-making time-point. This longitudinal study examined the psychological wellbeing of men eligible for AS. The paucity of such data to date has significantly limited the conclusions that could be drawn from previous research.[12]

Although from one geographical region, the sample is in some respects reflective of PCa globally (70% of cancers occurring in the developed world[27]) and provides a useful indication of the psychological well-being of men with lower-risk PCa prior to AS. Men who later opted for AS had the highest PCa-specific anxiety symptoms (MAX-PC) at baseline (Time 1), the only difference between groups at baseline, likely a result of the focus of the MAX-PC on PCa symptom burden, monitoring approaches, and disease progression which are factors considered when considering AS. Data from the Time 1 indicates that despite no significant differences in general psychological wellbeing (generalized anxiety and depression symptoms), physical QoL, or PCa knowledge, the majority of men opt for AT risking debilitating treatment induced urinary, sexual, and bowel dysfunction, in spite of eligibility for AS.

Over 77% of men eligible for all treatment options including AS did not opt for AS. Although it was anticipated that a proportion of the men included in the study would opt for immediate curative treatment due to personal preferences, the extent of this was unexpected. The lack of differences in perceived QoL and PCa knowledge between participant groups suggests that these patterns of patient treatment decision-making was not a result of physical side-effects or knowledge of cancer. Qualitative data into the treatment decision making of patients who opted for AS of the present study is currently in preparation for publication.[28]

On all three psychological outcome measures used, overall AS patients had the least favorable scores across timepoints. Although PCa-specific anxiety symptoms tended to decline over time for both AS and AT patients, AS patients remained significantly higher than AT at all timepoints. Generalized anxiety symptoms increased with time since diagnosis for AS patients, and depression symptoms increased up to 6 months post-baseline before

dropping slightly at 9 months. AT patient psychological dysfunction generally decreased with time. Non-cancer control participants' psychological dysfunction remained stable and low across timepoints.

Non-cancer participants demonstrated the highest psychological wellbeing on all quantitative psychological measures in comparison to the PCa patient groups. The high scores on anxiety and depression symptoms observed in men with favorable-risk PCa suggests that medical perception that a favorable-risk diagnosis (as compared to a later stage, higher risk diagnosis requiring immediate curative treatment) carries with it favorable psychological morbidity, may not necessarily be the case. The assumption that patients are not experiencing distress is inaccurate, and may be a factor in uptake of potentially unnecessary AT,[29] as despite eligibility for AS, the majority of participants opted for AT (e.g. RP, RT, or BT).

The increase in AS patients' generalized anxiety symptoms over time contradicts previous research that reported declining anxiety in this group.[23,24,30–34] Much of international AS research has been conducted on men being managed in centers with a strong focus on AS who have been refining and perfecting the diagnosis experience for almost two decades and therefore AS is more widely accepted by clinicians and patients.[19,26] This study demonstrates that men's experience of diagnosis in a non-specialist AS center appears to be different. Centers with the specialist focus on AS should be used as a guide to improving men's experiences in non-specialist AS institutions. The literature reporting favorable outcomes of AS patients managed in specialist institutions must be interpreted with caution when applying findings to non-specialist institutions.

We should not underestimate the importance of the clinician in the decision to undergo AS. The Salzburg Statement on Shared Decision-Making[35] states that the medical community has an ethical imperative to ensure patients are fully aware of the nature of their illness, and the communication of illness characteristics must be targeted to individual patient needs. Results from a previous trial demonstrate that it is *"quite possible, using trained counsellors, to convey the appropriate information about not needing to rush a decision*".[36,37] Other research, however, has discussed the impact of giving patients choice without sufficient support to make that choice, and reported that this leaves patients feeling *"abandoned rather than autonomous"*.[38] A previous study examining decision making in PCa patients has shown that even when using decision aids, information provided was not well understood[39]. This has

important implications for PCa patients diagnosed with favorable-risk disease who have AS and a range of AT options open to them, with little difference in survival rates.

*Study limitations*

Questionnaires used to assess psychological wellbeing were based on self-report leading to potential bias. Further, the scales used (CES-D, STAI-6, MAX-PC) are not validated for diagnosis of depressive or anxiety disorders, rather they provide an indication of a number of the symptoms associated with such diagnoses therefore findings should be interpreted with this in mind.

The majority of the sample was white, in a significant relationship/married, and heterosexual. This demographic profile is generally consistent with this age group and geographic location from which this study sample is drawn,[40] however lack of men from African and Afro-Caribbean ethnicity means that the results are not generalizable beyond this population. Education level also differed between PCa and non-cancer participants, likely a result of one of the recruitment methods for non-cancer participants. Due to slow recruitment from peer-nomination, as well as the community and men's groups, recruiting from university staff lists was considered a necessary recruitment strategy. We ensured all staff across the university received the invitation (i.e. security, maintenance, estates, teaching, research etc) in an attempt to improve educational heterogeneity of the sample.

Despite lack of statistical power, results of this study are important to consider when designing future research in this area.

*Clinical implications*

Findings suggest that the clinician plays an important role in patient treatment decision-making, and that men had varying levels of psychological wellbeing post-diagnosis based on that treatment decision-making. Health Care Professionals must ensure their patients have an accurate understanding of the favorable-risk nature of their disease and should not assume that there is a linear, positive relationship between PCa severity and distress. This study suggests that when patients are faced with a diagnosis of lower-risk PCa and all the treatment options that come with that diagnosis, they report adverse psychological wellbeing. Previous research demonstrates that the most favorable psychological outcomes occur when patients have a role in treatment decision-making.[38] Clinicians must support patients to make the most appropriate treatment decisions based on patient priorities and clinical judgement, to achieve

the most favorable outcomes for their patients in terms of survival, physical QoL, and psychological wellbeing.

Future research should explore how patient individual differences (e.g. personality, baseline psychological wellbeing, health literacy) can be incorporated into clinical practice when attempting to communicate diagnosis and treatment information to promote accurate patient understanding of prognosis, and potential adverse side-effects of treatments to enhance patient care and experiences of diagnosis and treatment. In the longer term, this should help reduce financial burden associated with over-treatment and maximize patient wellbeing.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy/ethical restrictions.

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**Conflict of interests**

The authors declare no conflicts of interest.

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**Authors' Contributions**

ER, SP, JO'S, and GP contributed to the conceptualization, methodology, and investigation of the article. ER was responsible for data analysis under the supervision of MD. ER drafted the article. MD, SP, JO'S, and GP provided critical revisions. All the authors read and approved the final manuscript.

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| Table 1. Participant Demographic Characteristics | | | |
|---|---|---|---|
| | **Prostate Cancer Patients (n=54)** | | **Control group (n=53)** Men with no cancer diagnosis |
| | **Active Surveillance (n=11)** | **Active Treatment (n=43)** | |
| **Age, years (m, SD)** | 64.9 (5.79) | 62.2 (6.58) | 61.8 (5.90) |
| **PSA at diagnosis (ng/ML)** | 8.69 (4.67) | 11.84 (14.08) | - |
| **Gleason Score** | | | - |
| **3+3=6** | 8 (72.7%) | 10 (23.26%) | |
| **3+4=7** | 3 (27.3%) | 33 (76.74%) | |
| **Number of positive cores at diagnostic biopsy (m, SD)** | 2.55 (1.04) | 4.88 (2.74) | - |
| **Ethnicity (n, %)** | | | |
| **White** | 10 (90.9%) | 43 (100%) | 100% |
| **Mixed/Multiple** | 1 (9.1%) | 0 | 0 |
| **Education (n, %)** | | | |
| **Primary** | 0 | 4 (9.3%) | 0 |
| **Post-Primary** | 6 (54.5%) | 21 (48.8%) | 5 (9.4%) |
| **FE college** | 3 (27.3%) | 7 (16.3%) | 10 (18.9%) |
| **University** | 2 (18.2%) | 10 (23.3%) | 36 (67.9%) |
| **Prefer not to say** | 0 | 1 (2.3%) | 1 (1.9%) |
| **Missing** | 0 | 0 | 1(1.9%) |
| **Employment (n, %)** | | | |
| **Employed** | 4 (36.4%) | 12 (27.9%) | 20 (37.7%) |
| **Self-employed** | 1 (9.1%) | 6 (14%) | 5 (9.4%) |
| **Unemployed** | 0 | 2 (4.7%) | 1 (1.9%) |
| **Retired** | 6 (54.5%) | 21 (48.8%) | 26 (49.1%) |
| **Prefer not to say** | 0 | 1 (2.3%) | 0 |
| **Missing** | 0 | 1 (2.3%) | 1 (1.9%) |
| **Relationship status (n, %)** | | | |
| **In a relationship** | 7 (63.6%) | 39 (90.7%) | 44 (83.0%) |
| **Not in a relationship** | 3 (27.3%) | 3 (7%) | 7 (13.2%) |
| **Missing** | 1 (9.1%) | 1 (2.3%) | 2 (3.8%) |
| **Sexual orientation (n, %)** | | | |
| **Heterosexual** | 11 (100%) | 42 (97.7%) | 50 (94.3%) |
| **Homosexual** | 0 | 0 | 1 (1.9%) |
| **Bisexual** | 0 | 0 | 1 (1.9%) |
| **Missing** | 0 | 1 (2.3%) | 1 (1.9%) |
| **Male relative/s diagnosed with PCa (n, %)** | | | |
| **Yes** | 2 (18.2%) | 14 (32.6%) | 7 (13.2%) |
| **No** | 9 (81.8%) | 29 (67.4%) | 45 (84.9%) |
| **Missing** | 0 | 0 | 1 (1.9%) |
| **Other significant medical conditions (n, %)** | | | |
| **Yes** | 3 (27.3%) | 12 (27.9%) | 17 (32.1%) |
| **No** | 8 (72.7%) | 29 (67.4%) | 35 (63.0%) |
| **Missing** | 0 | 2 (4.7%) | 1 (1.9%) |

**Table 2. Summary Scores: Depression, generalized anxiety, PCa-specific anxiety symptoms**

| | **Prostate Cancer Patients (n=54)** | | | | | | | | **Control group (n=53)** Men with no cancer diagnosis | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Active Surveillance (n=11)** | | | | **Active Treatment (n=43)** | | | | | | | |
| | *Time 1 (n=11)* | *Time 2 (n=10)* | *Time 3 (n=10)* | *Time 4 (n=9)* | *Time 1 (n=43)* | *Time 2 (n=37)* | *Time 3 (n=37)* | *Time 4 (n=34)* | *Time 1 (n=53)* | *Time 2 (n=46)* | *Time 3 (n=45)* | *Time 4 (n=40)* |
| **Depression symptoms** (CES-D; m, SD) [Clin threshold ≥16] | 10.333 (9.33) | 11.11 (12.33) | 13.44 (13.44) | 11.33 (14.33) | 10.78 (8.45) | 11.30 (9.40) | 10.55 (8.60) | 8.88 (8.45) | 6.83 (7.71) | 7.03 (9.00) | 7.18 (9.15) | 6.70 (10.00) |
| **Generalised anxiety symptoms** (STAI-6; m, SD) [Clin threshold ≥44] | 36.56 (12.02) | 36.89 (15.37) | 38.46 (18.45) | 38.89 (16.83) | 37.73 (12.51) | 34.94 (12.67) | 31.67 (10.35) | 32.67 (12.49) | 28.25 (11.06) | 27.63 (10.76) | 28.16 (12.17) | 28.21 (12.68) |
| **PCa-specific anxiety symptoms** (MAX-PC; m, SD) [Clin threshold ≥27] | 22.78 (11.96) | 20.78 (15.45) | 20.11 (13.03) | 20.22 (13.94) | 16.24 (9.63) | 14.38 (8.06) | 12.71 (8.82) | 12.79 (8.83) | - | - | - | - |

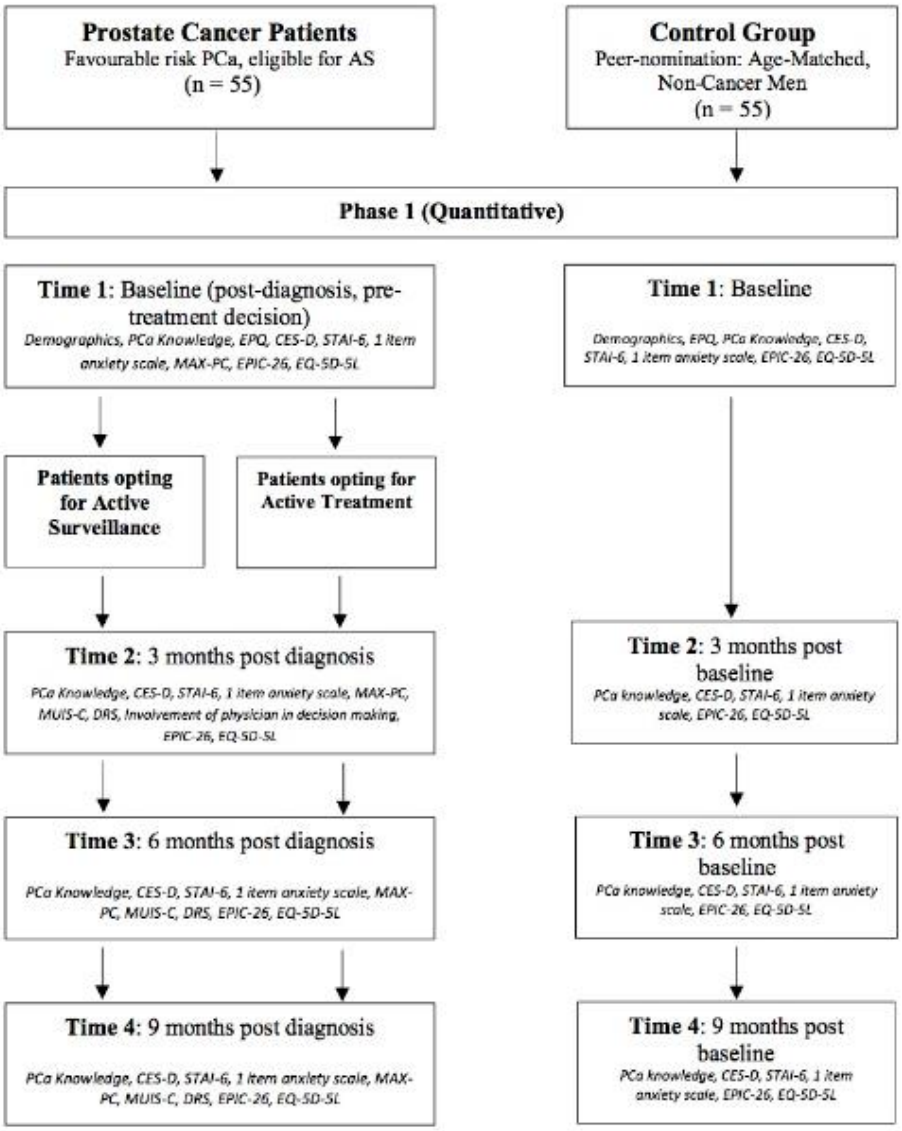


Figure 1. Study procedure flow chart

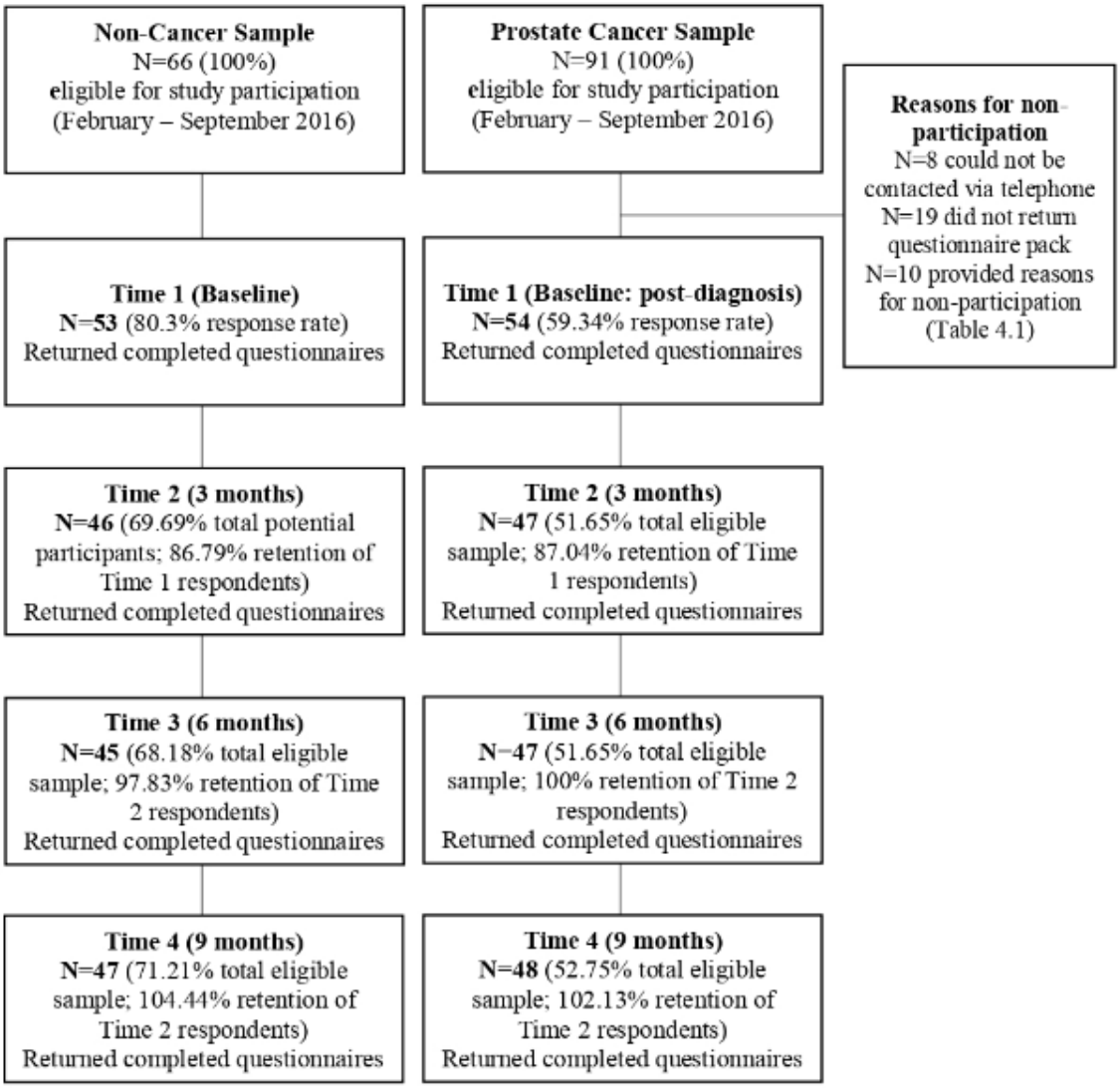


Figure 2. Flow diagram of potential participants and respondents at each time point.