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Psychological distress in Saudi prostate cancer patients: exploring prevalence and sociodemographic influences

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Abstract

Background Prostate cancer patients frequently experience significant psychological distress, which can negatively impact treatment adherence and quality of life. However, research on psychological outcomes in Saudi Arabian prostate cancer patients remains limited. This study aimed to assess the prevalence of depression, anxiety, and loneliness in this population and examine associated sociodemographic factors.

Methods A descriptive cross-sectional study was conducted between October 2023 and May 2024 among 433 Saudi men diagnosed with prostate cancer across various regions of Saudi Arabia. Data were collected through face-to-face interviews using validated screening tools: the Patient Health Questionnaire-2 (PHQ-2) for depression, Generalized Anxiety Disorder-2 (GAD-2) for anxiety, and the 3-item UCLA Loneliness Scale (UCLA-3) for loneliness. Multiple logistic regression analyses were performed to identify sociodemographic predictors of psychological distress.

Results The study revealed high prevalence rates of depression (35.1%), anxiety (30.5%), and loneliness (31.9%). Depression demonstrated strong positive correlations with anxiety ($r=0.72$, $p<0.01$) and loneliness ($r=0.68$, $p<0.01$). Low income (<5000 SAR) showed the strongest association with anxiety (OR = 2.71, 95% CI = 1.30–5.65, $p<0.01$), followed by depression (OR = 2.66, 95% CI = 1.32, 5.34, $p<0.01$), and loneliness (OR = 2.10, 95% CI = 1.03, 4.27, $p<0.01$). Being privately employed was significantly associated with higher anxiety (OR = 0.51, 95% CI = 0.26–0.99, $p<0.04$) and loneliness (OR = 0.52, 95% CI = 0.27–1.00, $p<0.03$).

Conclusion Saudi prostate cancer patients experience substantial psychological distress, particularly among socioeconomically vulnerable groups. These findings underscore the urgent need for routine psychological screening, culturally sensitive mental health interventions, and targeted policy reforms. Integrating psychosocial care into oncology services can enhance patient outcomes and inform national cancer care strategies in Saudi Arabia.

Keywords Psychological distress, Depression, Anxiety, Loneliness, Prostate cancer, Saudi Arabia

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Introduction

Prostate cancer is the second most diagnosed cancer in men globally, with 1.41 million new cases and 375,304 deaths worldwide in 2020 [1]. In Saudi Arabia, it accounts for 6.1% of male cancers, with 693 new cases and over 200 deaths reported in 2020 [2]. Despite the advancement in treatment options [3], around 35% of prostate cancer patients experience significant psychological distress [4]. A meta-analysis examining various cancer types, including prostate cancer, found that approximately one in four patients experience depression, nearly twice the general population rate [5]. Similarly, high anxiety prevalence and significant loneliness have been documented [6, 7].

These psychological challenges significantly impact treatment outcomes and quality of life [8–10]. Research shows that chronic stress can suppress immune function [11], while depression reduces treatment adherence [12], and social isolation increases mortality risk [13]. Integrating psychological support into standard treatment protocols has demonstrated reduced distress and improved outcomes [14].

In Saudi Arabia, cultural and systemic barriers complicate mental health screening among cancer patients. Traditional beliefs often attribute psychological symptoms to spiritual causes rather than medical conditions. For example, mental illnesses are frequently understood as being caused by possession by spirits, witchcraft, or curses, which influences health-seeking behaviors and leads individuals to prefer traditional healers or spiritual therapies over conventional medical treatments [15, 16]. Surrounding mental health further discourages individuals from pursuing psychological support [17]. Moreover, the healthcare system struggles to implement routine mental health screening due to a lack of Arabic-validated assessment tools and a shortage of trained mental health professionals [18].

Recent research from the Middle East has increasingly recognized the substantial psychological burden experienced by cancer patients in this region. Systematic reviews and cross-sectional studies from countries such as Lebanon, Egypt, and Jordan consistently report high prevalence rates of depression, anxiety, and social isolation among oncology patients. For instance, a large meta-analysis covering 14 countries in the Middle East and North Africa (MENA) found that the prevalence of depression and anxiety among cancer patients was 44% and 47%, respectively, with significant variation across countries [19]. In Lebanon, a single-center study reported moderate or severe depression in 22.7% and moderate or severe anxiety in 14.9% of newly diagnosed cancer patients, with even higher rates of mild depression and minimal anxiety [20]. These psychological challenges are often exacerbated by cultural stigma surrounding mental illness and limited access to mental health services,

as well as by traditional beliefs and a lack of psychosocial support, particularly noted in studies from Egypt. Social isolation and underutilization of psychiatric care further compound the problem, with only a small proportion of affected patients receiving appropriate treatment [19, 21].

Although prostate cancer is one of the most frequently diagnosed cancers among Saudi men, the psychological distress associated with the disease remains insufficiently explored. This gap is explicitly concerning given the cultural stigma and systemic barriers surrounding mental health in Saudi Arabia. A deeper understanding of the psychological challenges faced by this population is essential for designing culturally appropriate interventions and support services. We hypothesize that depression, anxiety, and loneliness are prevalent among Saudi prostate cancer patients and are significantly influenced by sociodemographic factors. This study aims to assess the prevalence of these psychological conditions and analyze their association with key sociodemographic variables.

Methods

Research design

A cross-sectional observational study was carried out between October 2023 and May 2024, targeting Saudi males diagnosed with prostate cancer across multiple regions of Saudi Arabia. The study was designed and reported in alignment with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines, and a completed STROBE checklist is provided as supplementary material.

Participants and sampling

Participants were selected using non-probability convenience sampling from government hospitals, based on their availability and willingness to participate. The study included adult male patients aged 35 to 80 years with a confirmed diagnosis of prostate cancer, regardless of cancer stage or treatment status. This age range was selected based on previous studies indicating that prostate cancer typically affects individuals within this age group [22, 23]. Patients had to be Saudi nationals and be able to provide informed consent. We excluded patients with severe cognitive impairment that could prevent them from understanding and completing the questionnaires, those with a history of pre-existing psychiatric disorders unrelated to their cancer diagnosis, and those who were too ill to participate in the study. Patients with other concurrent cancers were also excluded to ensure that the psychological outcomes measured were primarily related to prostate cancer.

The minimum sample size was calculated using Rao-soft's online sample size calculator (<http://www.raosoft.com/samplesize.html>), with a 95% confidence level and

a 5% margin of error. It was determined that 385 participants would be required for the study. A total of 520 patients were approached, and 433 consented to participate, yielding an 83.3% response rate.

Data collection

The researchers and research assistants approached eligible participants in person at healthcare facilities, explained the study, and obtained informed consent from them. They conducted face-to-face interviews using a structured questionnaire in Google Forms to collect data. The face-to-face interview method was chosen to ensure high response rates and to assist participants who might have difficulty reading or understanding specific questions. Interviewers were trained to maintain consistency in their approach and to provide clarification without influencing the participants' responses.

To further mitigate potential bias, interviewers received standardized training that emphasized strict adherence to neutral phrasing and delivery of all questions. When clarification was needed, interviewers were instructed to rephrase questions using neutral language without suggesting or implying any specific response. They were prohibited from offering examples, leading prompts, or evaluative comments. Moreover, interviews were conducted in a private setting to reduce social desirability bias and foster an environment in which participants felt comfortable providing honest responses.

Questionnaire

A pretest structured interviewer-administered questionnaire, designed after revising several surveys from similar published studies, was formulated as the data collection tool [24–26]. The Arabic version of the questionnaire was used for the convenience of the natives in responding, and it was subsequently translated back into English to ensure its validity.

The complete questionnaire contained 15 items and was divided into two sections. The first section comprised eight sociodemographic characteristics of prostate cancer patients, including age, living status, marital status, educational level, employment status, place of residence, and monthly personal income. The second section consisted of seven items assessing patients' levels of depression, anxiety, and loneliness using the following standardized scales. These are validated screening instruments designed to identify individuals at risk for psychological distress, but they are not intended to serve as diagnostic tools.

Patient health Questionnaire-2 (PHQ-2) scale

The PHQ-2 is a brief screening tool used across various chronic illness populations, including individuals with cancer [27–29] to detect depression. It includes the first

two items of the PHQ-9, assessing depressed mood and anhedonia over the past two weeks with response options from “not at all” to “nearly every day.” Each item is scored on a scale of 0 to 3, with a total score ranging from 0 to 6. A score of ≥ 3 suggests potential depression, making the PHQ-2 a valuable tool in time-constrained settings [30].

Generalized Anxiety Disorder-2 (GAD-2) scale

The GAD-2 is a two-item screening tool derived from the GAD-7, assessing anxiety severity by evaluating the frequency of nervousness and inability to control worrying over the past 2 weeks. Responses range from “not at all” to “nearly every day” on a scale of 0 to 3, with a total score of 0 to 6. A score of ≥ 3 indicates a possible generalized anxiety disorder, making the GAD-2 an effective tool for time-constrained clinical settings [31].

3-item UCLA loneliness scale

The UCLA-3 is a brief, three-item tool for assessing loneliness and social isolation derived from the longer UCLA Loneliness Scale. It evaluates feelings of loneliness, a lack of companionship, and a sense of being left out. Each item is scored from 1 to 3, with a total score range of 3 to 9. A score of < 6 indicates low to moderate levels of loneliness, and a score of ≥ 6 indicates higher levels of perceived loneliness [32].

Face validity, pilot testing, reliability, and internal consistency

Several previous studies have utilized Arabic versions of the PHQ-2, GAD-2, and UCLA-3 scales [33–35]. To further strengthen the validity of our study, we conducted a comprehensive validation process following established psychometric guidelines. Content validity was established through expert panel review, involving two academic pharmacists, one clinical pharmacist, and one psychologist, who evaluated each item for relevance, clarity, and cultural appropriateness within the Saudi healthcare context.

A pilot test was then conducted with 21 randomly selected participants (excluded from the final sample) to assess clarity and comprehension, with feedback indicating no need for modification. Test-retest reliability was evaluated using nine participants who completed the questionnaire twice within an interval of 30 min to 1 h, consistent with psychometric standards that consider reliability coefficients of $\geq 80\%$ as acceptable [36]. Internal consistency was assessed using Cronbach's alpha, yielding strong values: 0.98 for the GAD-2, 0.90 for the PHQ-2, and 0.94 for the UCLA-3 [37]. These steps were undertaken to ensure the cultural relevance and appropriateness of the PHQ-2, GAD-2, and UCLA-3 tools for use in the Saudi population, given potential cross-cultural differences in the expression of psychological constructs.

Statistical analysis

Data were analyzed using SPSS version 27. Descriptive statistics summarized sociodemographic data, with means and standard deviations for continuous variables and frequencies and percentages for categorical ones. The relationships between the scores from the PHQ-2, GAD-2, and UCLA-3 scales were analyzed using Pearson correlation coefficients. The multiple logistic regression test analyzed factors associated with depression, anxiety, and loneliness. A p -value of less than 0.05 was considered statistically significant. Multicollinearity among predictors was assessed using the variance inflation factor (VIF) values, with $VIF < 5$ considered acceptable [38].

Table 1 Prostate cancer patients' characteristics ($n = 433$)

Characteristics	n (%)
Age (years)	
≤ 45	224 (51.7)
> 45	209 (48.3)
Mean ± (SD)	46.8 ± (12.1)
Living Status	
Living Alone	47 (10.9)
Living with Family	386 (89.1)
Place of residence	
Rural	105 (24.2)
Urban	328 (75.8)
Marital status	
Single	83 (19.2)
Married	320 (73.9)
Divorced/ Widowed	30 (6.9)
Education level [†]	
Uneducated	22 (5.1)
General Education [*]	142 (32.8)
Bachelor's	240 (55.4)
Master's or Higher	28 (6.5)
Geographic area	
Central	72 (16.6)
Western	47 (10.9)
Southern	229 (52.9)
Eastern	76 (17.6)
Northern	9 (2.1)
Personal monthly income (S.A.R.) [‡]	
≤ 5000	76 (17)
6000–10,000	95 (21.9)
11,000–15,000	130 (30.0)
> 15,000	132 (30.5)
Employment status	
Retired with pension	90 (20.8)
Retired without pension	17 (3.9)
Private employee	83 (19.2)
Self-employed	44 (10.2)
Government employee	199 (46.0)

^{*}Primary, Intermediate, Secondary

[†]Educational Level ($n = 432$)

[‡]S.A.R.: Saudi Riyal

Results

Patients' sociodemographic characteristics

The study included 433 prostate cancer patients, with a mean age of 46.8 years ($SD = 12$), and 48.3% of them were older than 45 years. The majority (89.1%) lived with their families, predominantly in urban areas (75.8%). The patients were mostly married (73.9%) and had a bachelor's degree (55.4%). Geographically, most patients were from the southern region of Saudi Arabia (52.9%). Regarding income, 30.5% of the patients earned more than 15,000 SAR monthly. A sizable portion of the patients (46.0%) were government employees. The information presented in Table 1 provides a summary of the findings.

Prevalence of depression, anxiety, and loneliness

The psychological well-being of prostate cancer patients was evaluated using three different questionnaires: PHQ-2, GAD-2, and UCLA-3. The results showed that 35.1% (152) of the patients exhibited symptoms of depression, with an average score of 1.92 ± 1.88 . Additionally, 30.5% (132) of the patients experienced anxiety, as indicated by the GAD-2 scale, with an average score of 1.82 ± 1.89 . Finally, the UCLA-3 Loneliness Scale indicated that 31.9% (138) of patients reported feeling lonely, with an average score of 1.5 ± 0.60 . These findings are summarized in Fig. 1.

Correlation among depression, anxiety, and loneliness scales

As shown in Table 2. The study utilized Spearman's rank-order correlation to analyze the relationships among the depression, anxiety, and loneliness scales for prostate cancer patients. The document included a correlation matrix that showed the relationship among the depression, anxiety, and loneliness scales for prostate cancer patients. The PHQ-2 scale, which measures depression, was positively correlated with the GAD-2 scale, which measures anxiety ($r = 0.67$, $p < 0.01$), and the UCLA-3 scale, which measures loneliness ($r = 0.59$, $p < 0.01$). Additionally, the GAD-2 scale positively correlated with the UCLA-3 scale ($r = 0.58$, $p < 0.01$).

Multiple logistic regression analysis for the factors associated with depression (PHQ-2 Scale)

Based on the results in Table 3, the model significantly predicted depression based on patient characteristics ($\chi^2(19) = 33.22$, $p < 0.02$), explaining 10% of the variance in PHQ-2 scores. The model correctly classified 66.2% of cases, with high specificity (91.0%) but low sensitivity (21.1%). Personal monthly income was the only significant predictor; patients with a low income (< 5000 SR) were 2.66 times more likely to have depression compared with other income groups (95% CI [1.32, 5.34], $p < 0.01$).

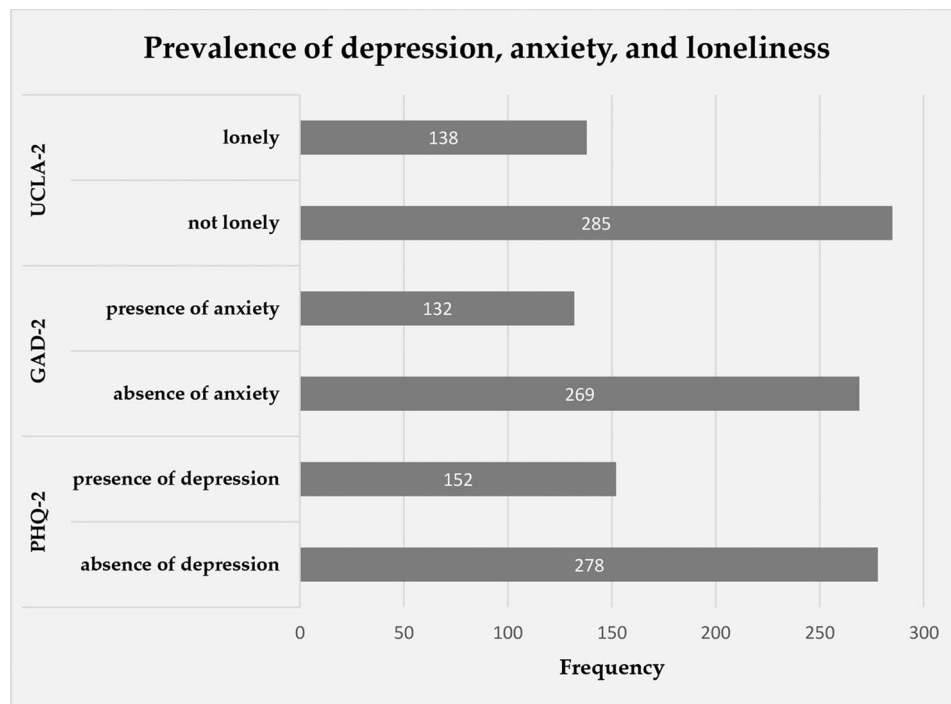


Fig. 1 Prevalence of depression, anxiety, and loneliness in prostate patients correlation among depression, anxiety, and loneliness scales. *Percentages do not go up to 100 because of missing values and rounding. [†]PH.Q, Patient Health Questionnaire. [‡]G.A.D., Generalized Anxiety Disorder. [§]UCLA, University of California, Los Angeles Loneliness Scale

Table 2 Correlations matrix for depression, anxiety, and loneness scales

Scales	PHQ-2 scale		GAD-2 scale		UCLA-3 scale	
	<i>r</i>	<i>p</i> -value	<i>r</i> [†]	<i>p</i> -value	<i>r</i>	<i>p</i> -value
PHQ-2 scale			0.67	0.01*	0.59	< 0.01*
GAD-2 scale	0.67	0.01*			0.56	< 0.01*
UCLA-3 scale	0.59	< 0.01*	0.58	< 0.01*		

*Indicate statistical significance at $p < 0.05$. [†]*r*: Spearman correlation coefficient

Multiple logistic regression analysis for the factors associated with anxiety (GAD-2 scale)

Based on the results in Table 4, the model significantly predicted anxiety ($\chi^2(19) = 41.10$, $p < 0.02$), explaining 12.9% of the variance in GAD-2 scores. The model correctly classified 70.5% of cases, with high specificity (94.4%) but low sensitivity (15.9%). Low income (<5000 SAR) and private-sector employment were significant predictors. Patients with low income were 2.71 times more likely to experience anxiety (95% CI [1.30, 5.65], $p < 0.01$), while those employed in the private sector had significantly reduced odds of experiencing anxiety (OR = 0.52, 95% CI [0.26–0.99], $p < 0.04$) compared to other employment groups.

Multiple logistic regression analysis for the factors associated with loneliness (UCLA-3 scale)

Based on the results in Table 5, significant predictors of loneliness ($\chi^2(19) = 36.74$, $p < 0.01$) account for 12.9% of the variance in UCLA-3 scores. The model had a good fit

(71.1% classification accuracy) but low sensitivity (22.5%). Low-income patients (<5000 SR) were 2.10 times more likely to experience loneliness (95% CI [1.03, 4.27], $p < 0.01$), and Private sector employees also had lower odds of reporting loneliness (OR = 0.52, 95% CI [0.27–1.00], $p < 0.03$). Variance inflation factor (VIF) values for all predictors included in the regression models were below 2.0, indicating no significant multicollinearity.

Discussion

This study is the first to define the prevalence of depression, anxiety, and loneliness, as well as their associated factors, among patients with prostate cancer in Saudi Arabia. Being diagnosed with prostate cancer can be a life-changing and overwhelming experience that often leads to intense anxiety, deep depression, and feelings of isolation. The study findings revealed substantial psychological distress levels, aligning with meta-analytic evidence showing that approximately one-third of prostate cancer patients experience clinically significant

Table 3 Logistic regression predicting likelihood of depression based on prostate cancer patients' characteristics

Characteristics	B	Wald	p-Value	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
Age (y)	-0.11	0.19	0.66	0.89	0.54	1.48
≤ 45						
> 45						
Living Status	0.28	0.56	0.45	1.32	0.64	2.72
Living alone						
Living with family						
Place of residence	0.07	0.06	0.8	1.07	0.61	1.87
Rural						
Urban						
Marital status	0.6	1.55	0.21	1.82	0.7	4.71
Single	0.01	0	1	1.01	0.41	2.47
Married						
Divorced/Widowed						
Education level	0.95	1.72	0.18	2.59	0.62	10.76
Uneducated	0.06	0.02	0.89	1.07	0.39	2.91
General Education	0.31	0.38	0.53	1.34	0.52	3.44
Bachelor's						
Master's or higher						
Geographic area	0.22	0.07	0.79	1.25	0.24	6.47
Central	0.43	0.26	0.61	1.55	0.29	8.22
Western	0.37	0.21	0.64	1.45	0.3	7.02
Southern	0.89	1.14	0.28	2.45	0.47	12.71
Eastern						
Northern						
Personal monthly income (S.A.R.)	0.98	7.56	0.01*	2.66	1.32	5.34
≤ 5000	0.338	1.12	0.29	1.4	0.75	2.62
6000–10,000	30	1.12	0.29	1.35	0.77	2.37
11,000–15,000						
> 15,000						
Employment status	-0.23	0.51	0.47	0.79	0.42	1.49
Retired with pension	-0.08	0.02	0.88	0.92	0.3	2.81
Retired without pension	-0.37	1.41	0.24	0.69	0.37	1.28
Private employee	0.39	1.01	0.31	1.48	0.69	3.15
Self-employed						
Government employee						

*significant result ($p < 0.05$)

depression and anxiety [4]. The observed prevalence of loneliness is also consistent with prior research highlighting social isolation and loneliness as common challenges, often intensified by treatment-related functional changes and shifting social roles [7].

The study demonstrated moderate positive associations between depression, anxiety, and loneliness scores. This indicates that individuals with higher depression levels tend to experience increased anxiety and loneliness. Such a pattern is consistent with research showing these conditions frequently co-occur in individuals facing severe health challenges like cancer [39, 40].

Socioeconomic factors demonstrated a substantial influence on psychological well-being among participants. Patients with monthly incomes < 5000 SAR

exhibited significantly higher levels of psychological distress. Evidence from studies in Saudi Arabia indicates that low income is a significant predictor of psychological distress. For example, one study found that individuals with a monthly income of less than 1,000 SAR were more likely to experience psychological distress during the COVID-19 pandemic [41]. Another study on uninsured expatriate males in Saudi Arabia revealed more negative mental health outcomes among those earning less than 6,000 SAR compared to their higher-income counterparts [42]. These findings are consistent with broader research in the region, which consistently links lower income to increased psychological distress and reduced mental well-being [43, 44].

Table 4 Logistic regression predicting likelihood of anxiety based on prostate cancer patient characteristics

Characteristics	B	Wald	p-Value	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
Age (y)	0.3	1.2	0.27	1.35	0.79	2.3
≤ 45						
> 45						
Living Status	-0.01	0	0.98	0.99	0.46	2.12
Living alone						
Living with family						
Place of residence	-0.52	2.97	0.08	0.59	0.33	1.07
Rural						
Urban						
Marital status	-0.02	0	0.97	0.98	0.39	2.48
Single	-0.71	2.481	0.11	0.49	0.2	1.19
Married						
Divorced/Widowed						
Education level	0.7	0.93	0.34	2.02	0.48	8.435
Uneducated	-0.66	1.63	0.2	0.52	0.19	1.421
General Education ^a	-0.29	0.37	0.54	0.75	0.29	1.901
Bachelor's						
Master's or higher						
Geographic area	-0.39	0.21	0.64	0.68	0.13	3.52
Central	-0.04	0	0.96	0.96	0.18	5.09
Western	0.37	0.21	0.65	1.44	0.3	6.87
Southern	0.59	0.5	0.48	1.8	0.35	9.21
Eastern						
Northern						
Personal monthly income (S.A.R.)						
≤ 5000	1.01	7.09	0.01*	2.71	1.3	5.65
6000–10,000	0.51	2.32	0.13†	1.66	0.87	3.19
11,000–15,000	0.23	0.3	0.45†	1.26	0.69	2.28
> 15,000						
Employment status	-0.12	0.13	0.72	0.88	0.45	1.72
Retired with pension	-0.5	0.6	0.44	0.61	0.17	2.14
Retired without pension	-0.68	3.94	0.04*	0.51	0.26	0.99
Private employee	0.09	0.06	0.81	1.1	0.5	2.39
Self-employed						
Government employee						

*significant result ($p < 0.05$)

In contrast, private sector employment was associated with reduced odds of both anxiety and loneliness in our sample. This unexpected outcome may be attributed to differences in organizational culture and social support systems between the private and public sectors. For instance, research comparing public and private sector organizations highlights that private entities often emphasize programs and activities that foster trust, cohesiveness, and motivation to participate, key factors in strengthening interpersonal relationships within teams [45]. In addition, structured interventions such as play-based or team-building activities in private sector environments have been shown to positively influence social and emotional development, supporting the notion that these organizations invest in fostering a collaborative

and connected workplace culture [46]. Although previous studies have suggested associations between educational attainment and marital status with psychological outcomes in cancer patients [47, 48], our analysis did not find statistically significant associations between these variables and psychological distress in this sample.

Implications for clinical practice and health policy

These findings carry important implications for both clinical practice and health policy in Saudi Arabia. Clinically, prioritizing the integration of routine psychological screening and stepped-care interventions into oncology departments is essential for the timely identification and management of psychological distress among prostate cancer patients [49, 50]. Standardizing these practices

Table 5 Logistic regression predicting likelihood of loneliness based on prostate cancer patient characteristics

Characteristics	B	Wald	p-Value	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
Age (y)	0.21	0.62	0.43	1.23	0.73	2.08
≤ 45						
> 45						
Living Status	0.14	0.14	0.71	1.15	0.54	2.42
Living alone						
Living with family						
Place of Residence	-0.28	0.91	0.34	0.75	0.42	1.34
Rural						
Urban						
Marital status	0.52	1.12	0.29	1.68	0.64	4.4
Single	-0.03	0.01	0.94	0.97	0.39	2.42
Married						
Divorced/Widowed						
Education level	1.26	2.89	0.09	3.53	0.83	15.12
Uneducated	-0.11	0.05	0.82	0.89	0.33	2.39
General Education ^a	-0.22	0.22	0.64	0.8	0.32	2.02
Bachelor's						
Master's or higher						
Geographic area	-0.71	0.84	0.36	0.49	0.11	2.25
Central	-0.31	0.15	0.7	0.74	0.16	3.47
Western	-0.32	0.18	0.67	0.73	0.17	3.1
Southern	-0.34	0.19	0.66	0.71	0.15	3.28
Eastern						
Northern						
Personal monthly income (S.A.R.)						
≤ 5000	0.74	4.16	0.04*	2.1	1.03	4.27
6000–10,000	0.18	0.3	0.58	1.2	0.63	2.28
11,000–15,000	-0.16	0.27	0.61	0.86	0.48	1.54
> 15,000						
Employment status						
Retired with pension	-0.23	0.47	0.49	0.79	0.4	1.54
Retired without pension	0.29	0.26	0.61	1.33	0.43	4.11
Private employee	-0.65	3.83	0.03*	0.52	0.27	1
Self-employed	-0.13	0.11	0.74	0.87	0.39	0.19
Government employee						

*significant result ($p < 0.05$)

across both public and private healthcare institutions can promote equitable access to mental health support [51]. From a policy perspective, our results emphasize the need for national guidelines that formally incorporate psychosocial care into cancer treatment protocols. This aligns with emerging global standards in psycho-oncology and will help ensure consistency in care delivery across Saudi oncology services [49, 52]. Adopting a structured stepped-care model where oncology staff trained in basic psychological care provide initial support, with clear referral pathways for complex cases, has been recommended to improve patient outcomes and ensure continuity of care [50, 53]. Providing gender-matched healthcare professionals is also identified as a culturally sensitive approach to enhance patient comfort

and engagement, particularly in Saudi Arabia's sociocultural context [54]. Furthermore, addressing the socioeconomic contributors to psychological distress through targeted social policies, such as income support for low-income cancer patients and legal protections to safeguard employment during treatment, could substantially mitigate the financial and employment-related stressors identified in this study [49, 55, 56].

Study limitations

This study has several limitations, which can be categorized as methodological and contextual, each with potential implications for the interpretation of our findings.

Methodological limitations. First, the PHQ-2, GAD-2, and UCLA-3 are validated screening tools; however,

they are brief and not diagnostic; using more comprehensive instruments (e.g., PHQ-9, GAD-7, or clinician-administered interviews) could improve the accuracy of prevalence estimates. Second, the study did not include clinical variables such as cancer stage, treatment status, time since diagnosis, or comorbidities, which may have influenced psychological outcomes and introduced residual confounding. Third, the use of convenience sampling from selected government hospitals may limit the representativeness of the sample and affect the generalizability of the results to the broader population of prostate cancer patients in Saudi Arabia. Fourth, the cross-sectional design prevents causal interpretation of associations observed between sociodemographic factors and psychological outcomes. Finally, face-to-face interviews, while useful for ensuring high response rates, may have been subject to social desirability bias, potentially leading to underreporting of distress symptoms.

Contextual limitations. Cultural factors, such as traditional male roles, religious beliefs, and stigma surrounding mental illness in Saudi Arabia, may have influenced both the expression of psychological symptoms and participants' willingness to report them. Moreover, the current lack of standardized national guidelines for psycho-oncology services in Saudi Arabia means that variations in access to psychosocial support across healthcare settings cannot be accounted for. These contextual factors may limit the comparability of our findings with studies from other regions and should be considered when interpreting the study's implications for clinical practice and policy.

Future research should address the limitations of this study by employing longitudinal designs to clarify temporal and causal relationships between sociodemographic factors, clinical variables, and psychological distress in prostate cancer patients. In addition, intervention-based studies are needed to evaluate the effectiveness of psychosocial support programs, including stepped-care models, cognitive-behavioral interventions, and culturally tailored psycho-oncology services, in reducing depression, anxiety, and loneliness in this population. Implementing and assessing the impact of routine psychological screening in oncology settings through pragmatic clinical trials would further inform best practices for integrating mental health care into prostate cancer management. Moreover, multicenter studies across diverse healthcare settings and regions of Saudi Arabia are recommended to enhance the generalizability of findings and explore potential geographical disparities in psychological outcomes. Applying advanced statistical techniques, such as structural equation modeling, could also provide a more nuanced understanding of the interrelationships among psychological variables and inform the design of targeted, culturally sensitive interventions.

Such future research will be critical to developing an evidence-based framework for improving psychosocial care in Saudi oncology practice.

Conclusions

This study highlights a substantial psychological burden among Saudi Arabian prostate cancer patients, with nearly one-third experiencing depression, anxiety, or loneliness. Low income and private sector employment were key predictors of distress. These findings call for systematic psychological screening and culturally sensitive interventions in oncology care. We recommend integrating brief, validated tools (Distress Thermometer, PHQ-2, GAD-2) into routine workflows at key clinical milestones. Oncology staff should deliver initial support within a stepped-care model, with clear referral pathways for specialized services. Policymakers should also develop targeted programs to address financial and employment-related stressors, which significantly impact patient well-being. Such measures could improve treatment adherence, quality of life, and clinical outcomes.

Abbreviations

PHQ-2	Patient Health Questionnaire-2
GAD-2	Generalized Anxiety Disorder-2
UCLA-3	3-item UCLA Loneliness Scale
MENA	Middle East and North Africa
SPSS	Statistical Package for the Social Sciences
SAR	Saudi Arabian Riyal

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s40359-025-03074-4>.

Supplementary Material 1

Supplementary Material 2

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Author contributions

Data Collection: A.M.H, M.A.A., F.A., O.A.M., A.K., S.S.A., and S.A. were responsible for collecting the study data. Their tasks included gathering relevant information, ensuring data accuracy and completeness, and compiling datasets necessary for analysis. They followed standardized procedures to maintain the integrity and reliability of the collected data. Manuscript Writing: F.A., O.A.M., S.O.A., A.M.A., B.K.A., and M.A. contributed to drafting the manuscript. They collaboratively developed the structure, articulated the research objectives, analyzed findings, and prepared the content in accordance with journal guidelines. Each author contributed their expertise to specific sections to ensure comprehensive coverage of the study. Statistical Analysis: F.A. and O.A.M. were responsible for conducting statistical analyses. They performed data processing, applied appropriate statistical methods, interpreted the results, and validated the findings to ensure accuracy and reliability. Their contributions were critical in deriving meaningful insights from the collected data. Review and Corrections: F.A., O.A.M., A.M.H., M.A.A., M.A., S.O.A., S.S.A., and S.A. thoroughly reviewed the manuscript to identify

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical approval and consent to participate

This study was conducted following the ethical standards of the institutional research committee and was approved by the Standing Committee for Scientific Research at Jazan University, Jazan, Saudi Arabia (HAPO-10-Z-001; July 17, 2022). Participants in the study were informed about the purpose, objectives, and their rights to participate, decline participation, or withdraw from the research activities verbally. Respondents have been notified that the information given was private and confidential and will only be used for academic purposes. Written informed consent was obtained from all respondents.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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