Li G, Zhao J, Peng C, Wang Z, Li B, Wang X. Psychological Concerns in Prostate Cancer Patients Under Active Surveillance. *Health Psychology Research.* 2026;14(1):e81240062.
https://doi.org/10.14440/hpr.0235

Review

Psychological Concerns in Prostate Cancer Patients Under Active Surveillance

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Keywords: Prostate cancer, Active surveillance, Psychological concerns, Anxiety, Depression, Quality of life, Coping strategies, Mental health support

Health Psychology Research
Vol. 14, 2026

Background

Active surveillance (AS) is widely used to manage low-risk prostate cancer and reduce overtreatment; however, it introduces significant psychological challenges linked to living with untreated cancer. This review synthesizes evidence on the psychological burden faced by AS patients, including anxiety, depression, fear of cancer progression, decision-making distress, and threats to masculinity and sexual identity. Patients often grapple with uncertainty about disease trajectory, perceiving AS as passive inaction, which exacerbates emotional strain. Contributing factors include inadequate social support, gaps in clinician communication, and socioeconomic disparities that affect access to care. Interventions such as psychoeducation, cognitive-behavioral therapy to reframe catastrophic thinking, mindfulness-based stress reduction, and peer support groups demonstrate efficacy in reducing distress and enhancing quality of life.

Objective

This review underscores the necessity of integrating mental health support into AS protocols through routine psychological screening and multidisciplinary care.

Conclusion

Future research should prioritize longitudinal studies on psychological trajectories and culturally tailored interventions to address diverse patient needs. By addressing these psychological dimensions, clinicians can optimize patient-centered care, improve adherence to surveillance, and ensure AS remains a sustainable, holistic strategy for managing prostate cancer.

1. INTRODUCTION

Prostate cancer (PCa) is the second most commonly diagnosed cancer among men globally, accounting for approximately 1.4 million new cases annually.[1] While mortality rates have declined due to early detection and treatment advancements, a significant proportion of cases are classified as low-risk (Gleason score ⩽ 6, prostate-specific antigen [PSA] < 10 ng/mL, and clinical stage T1–T2a).[2] For these patients, active surveillance (AS) has emerged as a preferred management strategy to mitigate the risks of overtreatment, such as urinary incontinence and erectile dysfunction associated with radical prostatectomy or radiation therapy.[3]

Active surveillance involves close monitoring through periodic PSA testing, digital rectal exams, magnetic resonance imaging (MRI), and repeat biopsies.[4] The goal is to delay or avoid definitive treatment unless there is evidence of disease progression. Despite its clinical benefits, AS introduces unique psychological challenges.[5] Unlike immediate treatment, which offers a sense of action, AS requires patients to live with untreated cancer, fostering

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uncertainty and emotional strain.[6] This review synthesizes current evidence on psychological concerns in AS patients, explores contributing factors, and evaluates interventions to improve mental health outcomes.

2. PSYCHOLOGICAL CONCERNS IN ACTIVE SURVEILLANCE

2.1. ANXIETY AND UNCERTAINTY

Anxiety is the most prevalent psychological concern among AS patients, affecting 20–40% of individuals.[7,8] This anxiety often peaks around surveillance appointments, termed "scanxiety," where patients await results that could indicate disease progression.[9-11] Anxiety stems from several sources, including (i) fear of progression (FoP), as patients worry that delayed treatment could reduce curability; (ii) distrust in surveillance protocols; and (iii) misconceptions about the reliability of PSA tests or biopsies exacerbate fears.[12]

Uncertainty, a core component of anxiety, is amplified by the lack of tangible action. Mishel's Uncertainty in Illness Theory posits that ambiguity about diagnosis and prognosis disrupts coping mechanisms.[13] AS patients often describe feeling "in limbo," struggling to reconcile the paradox of having cancer but receiving no treatment.[14] It was reported that 40% of AS patients in a multicenter study perceived surveillance as "doing nothing," leading to frustration and helplessness.[12] Younger patients (aged < 60 years) are particularly vulnerable, as they face decades of monitoring and potential progression risks.[15]

2.2. DEPRESSION

While less common than anxiety, clinically significant depression affects 10–15% of AS patients.[16] Key risk factors include: premorbid mental health conditions, a history of depression doubles the risk of post-diagnosis depressive symptoms; social isolation, lack of emotional support from partners or peers exacerbates feelings of loneliness; financial stress, chronic surveillance costs (e.g., copayments, travel) burden lower-income populations.[14,16]

Depression in AS patients is often underdiagnosed due to overlapping somatic symptoms (e.g., fatigue and sleep disturbances) and the stigma surrounding mental health in male populations.[16] Left untreated, depression can reduce adherence to surveillance protocols, as disengagement becomes a maladaptive coping strategy.[17]

2.3. FEAR OF PROGRESSION

Fear of progression is defined as the fear that cancer will metastasize or recur, leading to death, disability, or dependency.[16,18] In AS populations, FoP is pervasive, with 35–50% of patients reporting moderate-to-severe fears.[16] A meta-analysis linked FoP to the following conditions: catastrophic thinking; overestimating the likelihood of progression (e.g., assuming a 1% annual risk equates to imminent danger); hypervigilance to symptoms (e.g., misinterpreting benign urinary changes as signs of progression); existential distress; and confronting mortality earlier than age-matched peers.[19]

Fear of progression correlates strongly with reduced quality of life (QoL), sleep disturbances, and relationship strain. Notably, FoP persists even in patients with stable disease, suggesting that psychological support must extend beyond medical reassurance.[20]

2.4. DECISION-MAKING DISTRESS

The initial choice to pursue AS involves complex trade-offs between preserving QoL and accepting potential risks.[21] Decision-making distress arises from the following conditions: regret aversion, fear that delaying treatment could lead to irreversible harm; information overload, conflicting opinions from clinicians, family, or online sources; ambivalence, and fluctuating between confidence in AS and desire for definitive treatment.[19]

A qualitative study by Davison and Breckon[22] revealed that 60% of AS patients second-guessed their decision, particularly after hearing anecdotes of aggressive cancers in their peers. Shared decision-making (SDM) tools, such as decision aids comparing AS and treatment outcomes, can mitigate distress by aligning patient preferences with clinical recommendations.[23-25]

2.5. QUALITY OF LIFE

Active surveillance preserves physical QoL by avoiding treatment side effects, but mental health often suffers. In a five-year follow-up of 129 AS patients, emotional well-being fluctuated cyclically, dipping before surveillance tests and improving after negative results; social functioning declined in 20% of patients due to avoidance of activities perceived as risky (e.g., travel). At year three, 70% reported stable QoL, suggesting resilience develops over time.[26] Comparatively, AS patients report better physical QoL but worse mental health than those undergoing treatment, highlighting the need for targeted psychological interventions.[27]

2.6. MASCULINITY AND SEXUAL IDENTITY

Prostate cancer threatens self-perceived masculinity, which is often tied to sexual potency and physical vigor.[28] Even without treatment, AS patients may grapple with sexual dysfunction, anxiety, fear that cancer itself (not just treatment) causes erectile dysfunction; loss of virility, associating cancer with aging or weakness; and stigma, reluctance to disclose their diagnosis due to stereotypes about PCa and sexuality.[29,30] Cultural factors amplify these concerns.[31] In patriarchal societies, men may avoid seeking support to preserve their self-image as strong providers.[28]

3. FACTORS INFLUENCING PSYCHOLOGICAL WELL-BEING IN ACTIVE SURVEILLANCE PATIENTS

The psychological well-being of PCa patients under AS is influenced by a range of factors, both individual and contextual.[32] These factors include demographic characteristics, coping mechanisms, social support, and the quality of physician-patient communication.[33] Understanding how these factors impact mental health is essential for providing targeted interventions that can enhance the psychological resilience of patients with AS. In the following sections, we explore key factors that influence psychological well-being in AS patients, supported by relevant studies and references.

3.1. DEMOGRAPHIC CHARACTERISTICS

Demographic factors, such as age, socioeconomic status (SES), and educational background, can significantly affect how PCa patients respond psychologically to their diagnosis and the AS management strategy.

- Age: Age has been found to play a critical role in shaping the psychological experiences of PCa patients on AS. Younger patients, particularly those in their 50s and early 60s, tend to experience higher levels of anxiety and distress compared to older patients.[34,35] This may be due to a greater concern about the long-term consequences of living with cancer and the potential for disease progression while balancing work, family, and social responsibilities.[5] In contrast, older patients may be less anxious about the uncertainty of AS, as they may prioritize QoL over treatment.[36]
- Socioeconomic status: SES has also been found to influence psychological well-being in AS patients. Patients from lower SES backgrounds may experience greater psychological distress due to financial concerns, limited access to healthcare resources, and lower levels of education about PCa and AS.[37] Studies have shown that individuals with higher SES tend to report better mental health outcomes, as they are more likely to have access to psychological support, better healthcare, and more resources to manage stress.[38] Additionally, lower SES is often associated with greater perceived stigma and negative societal attitudes toward cancer, which can exacerbate feelings of distress and anxiety.[38] Ethnic minorities, such as Black men, report higher distrust in AS due to historical medical exploitation and higher PCa mortality rates.[39] Low health literacy due to misunderstanding medical jargon leads to unrealistic fears.[40] In addition, economic barriers, such as a lack of insurance coverage for mental health services, limit access to care.[41]
- Education level: Educational attainment plays a role in how patients understand and cope with their diagnosis. Higher levels of education are often linked to better knowledge about PCa and the AS process, which can reduce uncertainty and anxiety.[42] A previous study showed that PCa patients with higher education levels had better psychological outcomes because they were more likely to seek out information and support and felt more confident in making decisions about their care.[43] In contrast, patients with lower levels of education may struggle to understand complex medical information, contributing to feelings of helplessness and fear.[43]

3.2. COPING STRATEGIES

Coping strategies are psychological mechanisms that individuals use to manage stress and emotional challenges. In the context of PCa, the coping strategies adopted by patients undergoing AS can significantly affect their mental health outcomes.

- Adaptive coping: Patients who engage in adaptive coping strategies, such as seeking social support, acceptance, and problem-solving, tend to report lower levels of psychological distress.[44] A previous study reported that adaptive coping was associated with better psychological well-being and lower levels of anxiety and depression in PCa patients.[45] These strategies help patients manage uncertainty by focusing on what they can control (e.g., lifestyle changes, monitoring), rather than ruminating about uncontrollable aspects of their diagnosis, such as cancer progression.[12]
- Avoidant coping: Conversely, avoidant coping strategies, such as denial, avoidance, and wishful thinking, are often linked to poorer psychological outcomes. For PCa patients on AS, relying on avoidance can exacerbate feelings of anxiety and depression, as it prevents patients from confronting their fears and uncertainties directly. Studies show that avoidant coping is associated with greater emotional distress and a reduced ability to cope effectively with ongoing surveillance.[46] For example, patients who avoid regular follow-ups or delay seeking emotional support may find themselves increasingly overwhelmed by their diagnosis over time.[44,46,47]
- Cognitive reappraisal: The ability to reinterpret stressors in a more positive light has also been identified as a key coping strategy for PCa patients.[48] Men who were able to reframe their diagnosis as an opportunity for self-growth and reflection experienced lower levels of psychological distress.[49] For AS patients, learning to view the surveillance process as a proactive approach to managing their cancer, rather than a reminder of an impending threat, can help mitigate feelings of helplessness and anxiety.[50]

3.3. SOCIAL SUPPORT

Social support is a critical factor in promoting psychological resilience in cancer patients, including those undergoing AS. Strong social networks provide emotional comfort, practical assistance, and a sense of community, all of which contribute to better mental health outcomes.

- Family and friends: Emotional support from family members and close friends is one of the most significant factors in determining how patients cope with PCa and its surveillance.[51] Patients who reported high levels of social support from family and friends had better psychological adjustment to their cancer diagnosis.[52] In contrast, patients who felt isolated or lacked support from loved ones experienced higher levels of anxiety and depression. Social support can buffer against the emotional challenges of living with PCa, reassuring patients and reducing feelings of loneliness.[53]
- Support groups: In addition to family and friends, support groups specifically for PCa patients provide an invaluable source of emotional support.[54] These groups foster shared experiences and create a safe environment where patients can discuss their concerns about living with cancer and undergoing AS.[55] Support group participation is associated with improved psychological well-being, including reduced anxiety and depression.[56] Support groups provide patients with a sense of belonging and empowerment as they learn from others who are facing similar challenges.[55,57]
- Online support networks: For some patients, online support networks may be more accessible and preferable to in-person groups.[58] These networks can offer anonymity and the flexibility of engaging in support at one's own pace.[59] Online cancer support groups can reduce feelings of isolation, provide emotional comfort, and help patients manage the psychological burden of cancer.[60] For patients under AS, online forums can be

particularly helpful in addressing concerns about the surveillance process and connecting with others who understand their unique experiences.[61]

3.4. PHYSICIAN–PATIENT COMMUNICATION

Effective communication between patients and healthcare providers is crucial for promoting psychological well-being in PCa patients undergoing AS. Clear, empathetic, and consistent communication can reduce uncertainty, increase trust, and provide patients with the knowledge they need to feel in control of their health.[62] Effective clinician–patient communication is pivotal. Pickles *et al.*[63] outlined best practices: empathetic reassurance, acknowledging fears while emphasizing AS safety; clear timelines, providing a structured surveillance schedule to reduce ambiguity; inclusive language, avoiding terms like "watchful waiting," which patients equate with neglect. Patients with clinicians who dismiss concerns are twice as likely to disengage from AS, underscoring the need for communication training in oncology.[64-66]

- Clarity of information: Patients undergoing AS often experience significant anxiety due to the uncertainty of their diagnosis and the FoP. Providing clear, understandable, and transparent information about the AS process significantly reduces patients' anxiety.[67] When healthcare providers explain the rationale for AS, the monitoring process, and the likelihood of progression, patients are more likely to feel empowered and less fearful of the unknown.[65]
- Emotional support: In addition to providing information, healthcare providers must also offer emotional support to help patients cope with the psychological challenges of AS.[66] Patients who perceive their doctors as empathetic and supportive report higher levels of satisfaction with their care and better emotional adjustment.[68] For patients undergoing AS, this emotional support is particularly important, as the psychological burden of surveillance often stems from the perception of being "in limbo" or "waiting for bad news."[67] Open and empathetic communication helps to alleviate this sense of uncertainty and fosters trust between the patient and their healthcare provider.[69]
- Trust in the healthcare system: Trust in the healthcare system and the medical team is a critical determinant of psychological well-being.[64] When patients trust their doctors and feel confident in the treatment decisions made, they are less likely to experience anxiety and distress.[67] Patients with greater trust in their healthcare providers experienced lower levels of psychological distress, as they felt more secure in the management of their disease.[70] Trust in the medical team can also foster a collaborative approach to decision-making, where patients feel they are active participants in their care, further reducing anxiety.[71,72]

4. PSYCHOLOGICAL INTERVENTIONS AND SUPPORT

Given the psychological challenges faced by PCa patients undergoing AS, psychological interventions and support are vital to improving emotional well-being and QoL. Various strategies can be implemented to alleviate distress, manage anxiety and depression, and support patients in coping with uncertainty about their diagnosis. In this section, we discuss key psychological interventions that are beneficial for PCa patients on AS, including individual therapy, support groups, education, and relaxation techniques.

4.1. PSYCHOLOGICAL COUNSELING AND THERAPY

Psychological counseling plays a significant role in addressing the emotional distress and mental health concerns associated with AS. Several therapeutic approaches can be effective, depending on the individual patient's needs.

- Cognitive-behavioral therapy (CBT): CBT is one of the most researched and widely used psychological interventions for cancer patients.[73] It focuses on identifying and changing negative thought patterns that contribute to anxiety and depression, helping patients develop more adaptive ways of thinking and coping. CBT could significantly reduce anxiety and depression in PCa patients, including those under AS. By helping patients reframe catastrophic thoughts about cancer progression, CBT can provide significant relief from the distress caused by uncertainty.[48] CBT targets maladaptive thoughts (e.g., "My cancer will kill me").[73,74] Livingston *et al.*[75] reported that 12 weekly CBT sessions reduced depression scores by 50% in AS patients. Key strategies included cognitive restructuring of challenging, catastrophic thinking; behavioral activation by encouraging engagement in meaningful activities; and exposure therapy of gradual desensitization to cancer-related triggers.
- Mindfulness-based stress reduction (MBSR): MBSR is another evidence-based intervention that emphasizes mindfulness meditation, body awareness, and relaxation techniques to manage stress and improve emotional well-being.[75-78] A randomized controlled trial showed that MBSR improved mood, reduced anxiety, and enhanced QoL in cancer patients, including those with PCa.[77] MBSR helps patients stay present in the moment, reducing rumination about potential cancer progression.[79] This can be particularly helpful for patients under AS, where fear of recurrence and progression is a major source of anxiety.[76,80]
- Acceptance and commitment therapy (ACT): ACT focuses on promoting psychological flexibility by helping individuals accept distressing thoughts and feelings rather than avoiding them.[63,81] It encourages commitment to values-based actions despite uncertainty and challenges.[81] ACT has been shown to help cancer patients cope with chronic pain and emotional distress, improving their ability to live meaningfully in the face of illness.[82] This approach may be particularly useful for AS patients, who often need to manage the emotional burden of living with uncertainty while maintaining a fulfilling life.[63]

4.2. SUPPORT GROUPS

Psychological support for men on active surveillance (AS) for prostate cancer focuses on managing anxiety, uncertainty, and fear of disease progression through effective interventions include partners with peers and social networks (in person or online) to reduce the emotional burden of "living with cancer" without active treatment.

- Peer support groups: Peer support groups are valuable for providing emotional support and facilitating shared experiences among PCa patients undergoing AS.[60] These groups can offer a sense of community and reduce feelings of isolation, which are common among patients with AS who may feel that their situation is misunderstood by those around them.[83]
- Social networks: Strong social networks buffer against psychological distress. There are three protective factors: partner involvement, spouses attending medical appointments to improve patient coping through emotional validation; peer support groups, connecting with other AS patients to normalize fears and reduce isolation; and community engagement, volunteering, or maintaining work routines that foster purpose beyond cancer.[84] Conversely, strained relationships or dismissive attitudes ("You are lucky it is not serious") exacerbate distress.[6,85]
- Cancer-specific support groups: PCa-specific support groups have been shown to improve patients' psychological outcomes.[51] These groups provide a forum for individuals to share their emotional and practical concerns, coping strategies, and advice for managing uncertainty.[86] Participation in cancer-specific support groups was associated with improved emotional adjustment, reduced anxiety, and better overall QoL.[86] Such groups can be particularly beneficial for AS patients, who may experience a unique sense of uncertainty and anxiety about their diagnosis compared to patients receiving active treatment.
- Online support groups: For patients who may have difficulty attending in-person meetings due to logistical reasons, such as mobility issues or geographical distance, online support groups offer a valuable alternative.[58] Online cancer support groups can reduce feelings of isolation and help patients manage distress.[59] The online format allows patients to connect with others who are facing similar challenges in real time, offering a space for emotional expression and shared coping strategies. Online platforms also provide anonymity, which may encourage more open sharing of emotions.

4.3. PATIENT EDUCATION

Education is a powerful tool for reducing the psychological burden of PCa patients undergoing AS. Numerous patients experience anxiety due to a lack of understanding of their condition and the rationale behind AS.[87] Educational interventions aim to provide patients with the knowledge and tools they need to make informed decisions and feel more in control of their health. Structured education programs improve knowledge and reduce the FoP. In a recent report on a 6-week curriculum covering protocol, including cancer biology aspects by explaining indolent vs. aggressive tumor growth, surveillance procedure by clarifying the rationale for MRI and biopsies, and stress management by teaching relaxation techniques, participants demonstrated a 30% reduction in anxiety and improved adherence.[67]

- Informational workshops and seminars: Educational workshops that provide information on PCa, treatment options, the monitoring process, and the likely outcomes of AS have been shown to improve patients' emotional well-being. Educational programs targeting PCa patients were found to reduce anxiety and improve coping skills.[88] These interventions help patients feel less overwhelmed by the uncertainty associated with AS by providing them with accurate and understandable information about their cancer's progression and the monitoring process.[88,89]
- Written and digital resources: In addition to in-person seminars, written materials and digital resources (e.g., websites, brochures, and videos) can be effective tools for educating patients about PCa and AS.[90] These resources should address common concerns, such as the likelihood of cancer progression, the rationale behind AS, and the possible psychological impacts of living under surveillance.[90] PCa patients who received educational materials about their condition reported greater satisfaction with their care and felt more confident in their ability to manage the emotional aspects of living with cancer.[91]

4.4. MINDFULNESS AND RELAXATION TECHNIQUES

Mindfulness and relaxation techniques are non-invasive and easily accessible methods that can help PCa patients manage stress and improve their emotional state.[92] These interventions are particularly relevant for patients under AS, as they allow individuals to address the anxiety and fear related to cancer progression without requiring intensive therapy or ongoing medical involvement.[93]

- Progressive muscle relaxation (PMR): PMR is a technique that involves systematically tensing and relaxing different muscle groups to reduce physical and mental tension.[93] PMR has been shown to reduce stress, improve mood, and enhance overall well-being in cancer patients.[92,94] For PCa patients on AS, PMR can be a simple and effective way to manage anxiety between medical appointments and reduce overall levels of distress.
- Breathing exercises: Deep breathing exercises, such as diaphragmatic or paced breathing, can help regulate the body's stress response and promote relaxation.[95] Patients who engaged in deep breathing exercises experienced reduced anxiety and improved emotional regulation.[95] These techniques are easy to learn and can be practiced at home, offering AS patients a practical tool for managing their anxiety about cancer progression.[96]
- Yoga and Tai Chi: Both yoga and Tai Chi combine physical movement with meditation and deep breathing, offering an integrated approach to reducing stress and enhancing emotional well-being.[97] Yoga was effective in reducing psychological distress, including anxiety and depression, in cancer patients.[98] Similarly, Tai Chi has been found to improve mood, reduce stress, and enhance QoL in cancer patients.[99] For PCa patients under AS, these mind-body practices may provide both physical relaxation and emotional calm, enhancing overall psychological resilience.[100]

4.5. PHARMACOLOGICAL SUPPORT FOR MENTAL HEALTH CONCERNS

In certain cases, pharmacological interventions may be appropriate to help manage significant psychological distress. While psychological interventions, such as CBT and mindfulness, are highly effective, patients with moderate to severe depression or anxiety may benefit from medications to alleviate their symptoms. Selective serotonin reuptake inhibitors and selective serotonin-norepinephrine reuptake inhibitors are commonly prescribed for anxiety and depression in cancer patients.[101] For PCa patients on AS, medications may be used on a short-term basis or in conjunction with psychological therapies to manage distress. Healthcare providers must work closely with patients to monitor side effects and ensure that pharmacological interventions do not interfere with other aspects of their care.[102]

4.6. PSYCHOLOGICAL SUPPORT FOR PARTNERS AND CAREGIVERS

The psychological well-being of PCa patients is often closely linked to the emotional state of their partners and caregivers.[36] When caregivers are also under stress, their ability to provide support to the patient may be compromised, exacerbating the patient's distress. Offering psychological support and counseling to partners can help strengthen the emotional resilience of both the patient and their support system. Couples counseling, caregiver support groups, and joint interventions can improve communication, reduce distress, and improve overall outcomes for patients with AS.

In summary, psychological interventions for PCa patients on AS are critical in alleviating anxiety, depression, and other emotional challenges related to living with an indolent disease. Various approaches, including psychological counseling, support groups, patient education, mindfulness, and relaxation techniques, can provide significant relief. Tailored interventions that address the unique needs of this patient population can help individuals manage their emotional responses to uncertainty and lead more fulfilling lives while under surveillance. Ongoing research is needed to further refine these interventions and explore their long-term effectiveness in improving mental health outcomes for this group.

5. CONCLUSION

Prostate cancer patients under AS face profound psychological challenges, including anxiety, depression, and threats to masculinity. While AS avoids physical morbidity, its success hinges on addressing mental health through multidisciplinary care. Key recommendations include: (i) routine mental health screening during surveillance visits; (ii) culturally tailored interventions for diverse populations; and (iii) integration of SDM tools to alleviate decision-making distress. Future research should prioritize longitudinal studies to track psychological trajectories and randomized trials comparing intervention efficacy. By prioritizing mental health, clinicians can ensure AS remains a sustainable, patient-centered strategy.

ACKNOWLEDGMENTS

None.

FUNDING

This work was partially supported by the Guangdong Provincial Natural Science Foundation (General Project #2024A1515010342 to Dr. Xiangwei Wang) and the Guangdong Provincial Key Laboratory of Autophagy & Major Chronic Non-Communicable Diseases (Open Fund #2022B1212030003-KF202305 to Dr. Jiang Zhao).

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

DATA AVAILABILITY STATEMENT

Not applicable.

Submitted: 2 August 2025; Revision received: 22 December 2025; Accepted: 13 January 2026; Published: 31 March 2026

REFERENCES

1. Zhang Y, Wang P, Jia Z, Zheng Z, Wang J, Liang H. Global burden and risk factors of male cancers from 1990 to 2021, with forecasts to 2040. *Sci Rep*. 2025;15(1):5123. doi: 10.1038/s41598-025-88392-8

2. Moradpour Z, Barik A, Jorjani G, *et al*. Prostate cancer incidence and mortality linked to metalworking fluid exposure: a systematic review and meta-analysis. *Front Oncol*. 2024;14:1491159. doi: 10.3389/fonc.2024.1491159

3. Cooperberg MR, Meeks W, Fang R, Gaylis FD, Catalona WJ, Makarov DV. Time Trends and Variation in the Use of Active Surveillance for Management of Low-risk Prostate Cancer in the US. *JAMA Netw Open*. 2023;6(3):e231439. doi: 10.1001/jamanetworkopen.2023.1439

4. Eastham JA, Auffenberg GB, Barocas DA, *et al*. Clinically Localized Prostate Cancer: AUA/ASTRO Guideline, Part II: Principles of Active Surveillance, Principles of Surgery, and Follow-Up. *J Urol*. 2022;208(1):19-25. doi: 10.1097/JU.0000000000002758

5. Bellardita L, Valdagni R, van den Bergh R, *et al*. How does active surveillance for prostate cancer affect quality of life? A systematic review. *Eur Urol*. 2015;67(4):637-645. doi: 10.1016/j.eururo.2014.10.028

6. Parahoo K, McDonough S, McCaughan E, *et al*. Psychosocial interventions for men with prostate cancer: a Cochrane systematic review. *BJU Int*. 2015;116(2):174-183. doi: 10.1111/bju.12989

7. van den Bergh RC, Essink-Bot ML, Roobol MJ, *et al*. Anxiety and distress during active surveillance for early prostate cancer. *Cancer*. 2009;115(17):3868-3878. doi: 10.1002/cncr.24446

8. James C, Brunckhorst O, Eymech O, Stewart R, Dasgupta P, Ahmed K. Fear of cancer recurrence and PSA anxiety in patients with prostate cancer: a systematic review. *Support Care Cancer*. 2022;30(7):5577-5589. doi: 10.1007/s00520-022-06876-z

9. Steinkohl F, Luger AK, Gruber L, *et al*. Patients' anxieties and fears: a comparison between transrectal prostate biopsy and prostate MRI. *Transl Androl Urol*. 2024;13(10):2201-2208. doi: 10.21037/tau-24-239

10. Bui KT, Blinman P, Kiely BE, Brown C, Dhillon HM. Experiences with scans and scanxiety in people with advanced cancer: a qualitative study. *Support Care Cancer*. 2021;29(12):7441-7449. doi: 10.1007/s00520-021-06319-1

11. Feiler B. Scanxiety. Fear of a postcancer ritual. *Time*. 2011;177(24):56.

12. Donovan JL, Hamdy FC, Lane JA, *et al*. Patient-Reported Outcomes after Monitoring, Surgery, or Radiotherapy for Prostate Cancer. *N Engl J Med*. 2016;375(15):1425-1437. doi: 10.1056/NEJMoa1606221

13. Reinken DN, Reed SM. Mishel's uncertainty in illness theory: Informing nursing diagnoses and care planning. *Int J Nurs Knowl*. 2023;34(4):316-324. doi: 10.1111/2047-3095.12406

14. Hughes S, Everitt H, Stuart B, Band R. The experiences of men on active surveillance for prostate cancer and their significant others: A qualitative synthesis. *Psychooncology*. 2024;33(4):e6324. doi: 10.1002/pon.6324

15. Nilsson R, Naess-Andresen TF, Myklebust TA, Bernklev T, Kersten H, Haug ES. Fear of Recurrence in Prostate Cancer Patients: A Cross-sectional Study After Radical Prostatectomy or Active Surveillance. *Eur Urol Open Sci*. 2021;25:44-51. doi: 10.1016/j.euros.2021.01.002

16. Venderbos LD, van den Bergh RC, Roobol MJ, *et al*. A longitudinal study on the impact of active surveillance for prostate cancer on anxiety and distress levels. *Psychooncology*. 2015;24(3):348-354. doi: 10.1002/pon.3657

17. Taylor Z, Meyer K, Terrenzio D, *et al*. Mind matters: how anxiety and depression shape low-risk prostate cancer active surveillance adherence in a real-world population. *Can J Urol*. 2025;32(1):21-27. doi: 10.32604/cju.2025.064705

18. Kang DW, Fairey AS, Boule NG, Field CJ, Wharton SA, Courneya KS. A Randomized Trial of the Effects of Exercise on Anxiety, Fear of Cancer Progression and Quality of Life in Prostate Cancer Patients on Active Surveillance. *J Urol*. 2022;207(4):814-822. doi: 10.1097/JU.0000000000002334

19. Cunningham M, Murphy M, Sweeney P, Richards HL. Patient reported factors influencing the decision-making process of men with localised prostate cancer when considering Active

Surveillance-A systematic review and thematic synthesis. *Psychooncology*. 2022;31(3):388-404. doi: 10.1002/pon.5832

20. Meissner VH, Olze L, Schiele S, *et al*. Fear of cancer recurrence and disease progression in long-term prostate cancer survivors after radical prostatectomy: A longitudinal study. *Cancer*. 2021;127(22):4287-4295. doi: 10.1002/cncr.33836

21. Bayliss D, Duff J, Stricker P, Walker K. Decision-Making in Prostate Cancer: Active Surveillance Over Other Treatment Options. *Urol Nurs*. 2016;36(3):141-149.

22. Davison BJ, Breckon E. Factors influencing treatment decision making and information preferences of prostate cancer patients on active surveillance. *Patient Educ Couns*. 2012;87(3):369-374. doi: 10.1016/j.pec.2011.11.009

23. Montori VM, Ruissen MM, Hargraves IG, Brito JP, Kunneman M. Shared decision-making as a method of care. *BMJ Evid Based Med*. 2023;28(4):213-217. doi: 10.1136/bmjebm-2022-112068

24. Raychaudhuri R, Lin DW, Montgomery RB. Prostate Cancer: A Review. *JAMA*. 2025;333(16):1433-1446. doi: 10.1001/jama.2025.0228

25. Pekala KR, Shill DK, Austria M, Langford AT, Loeb S, Carlsson SV. Shared decision-making before prostate cancer screening decisions. *Nat Rev Urol*. 2024;21(6):329-338. doi: 10.1038/s41585-023-00840-0

26. Loeb S, Folkvaljon Y, Makarov DV, Bratt O, Bill-Axelson A, Stattin P. Five-year nationwide follow-up study of active surveillance for prostate cancer. *Eur Urol*. 2015;67(2):233-238. doi: 10.1016/j.eururo.2014.06.010

27. Willemse PM, Davis NF, Grivas N, *et al*. Systematic Review of Active Surveillance for Clinically Localised Prostate Cancer to Develop Recommendations Regarding Inclusion of Intermediate-risk Disease, Biopsy Characteristics at Inclusion and Monitoring, and Surveillance Repeat Biopsy Strategy. *Eur Urol*. 2022;81(4):337-346. doi: 10.1016/j.eururo.2021.12.007

28. Muermann MM, Wassersug RJ. Prostate Cancer From a Sex and Gender Perspective: A Review. *Sex Med Rev*. 2022;10(1):142-154. doi: 10.1016/j.sxmr.2021.03.001

29. Oliffe JL, Bottorff JL. The Gendered Dimensions of Photovoice in Men's Health Promotion Research. *Health Promot Pract*. 2022;23(2):317-324. doi: 10.1177/15248399211055432

30. Tiruye T, O'Callaghan M, Ettridge K, *et al*. Factors impacting on sexual function among men on active surveillance for prostate cancer. *Prostate*. 2023;83(7):678-687. doi: 10.1002/pros.24502

31. Dordoni P, Remmers S, Valdagni R, *et al*. Cross-cultural differences in men on active surveillance' anxiety: a longitudinal comparison between Italian and Dutch patients from the Prostate cancer Research International Active Surveillance study. *BMC Urol*. 2022;22(1):110. doi: 10.1186/s12894-022-01062-z

32. Brunckhorst O, Liszka J, James C, *et al*. Mental wellbeing and quality of life in prostate cancer (MIND-P): Protocol for a multi-institutional prospective cohort study. *PLoS One*. 2023;18(4):e0284727. doi: 10.1371/journal.pone.0284727

33. Iremashvili V, Soloway MS, Rosenberg DL, Manoharan M. Clinical and demographic characteristics associated with prostate cancer progression in patients on active surveillance. *J Urol*. 2012;187(5):1594-1599. doi: 10.1016/j.juro.2011.12.082

34. Tohi Y, Kato T, Matsuda I, *et al*. Active surveillance in younger patients with prostate cancer: clinical characteristics including longitudinal patient-reported outcomes. *Jpn J Clin Oncol*. 2023;53(4):335-342. doi: 10.1093/jjco/hyac201

35. Mahran A, Turk A, Buzzy C, *et al*. Younger Men With Prostate Cancer Have Lower Risk of Upgrading While on Active Surveillance: A Meta-analysis and Systematic Review of the Literature. *Urology*. 2018;121:11-18. doi: 10.1016/j.urology.2018.06.048

36. Orom H, Underwood W 3rd, Biddle C. Emotional Distress Increases the Likelihood of Undergoing Surgery among Men with Localized Prostate Cancer. *J Urol*. 2017;197(2):350-355. doi: 10.1016/j.juro.2016.08.007

37. Gallagher BDT, Coughlin EC, Nair-Shalliker V, McCaffery K, Smith DP. Socioeconomic differences in prostate cancer treatment: A systematic review and meta-analysis. *Cancer Epidemiol*. 2022;79:102164. doi: 10.1016/j.canep.2022.102164

38. Wieckiewicz G, Weber S, Florczyk I,

Gorczyca P. Socioeconomic Burden of Psychiatric Cancer Patients: A Narrative Review. *Cancers*. 2024;16(6):1108. doi: 10.3390/cancers16061108

39. Deka R, Courtney PT, Parsons JK, *et al*. Association Between African American Race and Clinical Outcomes in Men Treated for Low-Risk Prostate Cancer With Active Surveillance. *JAMA*. 2020;324(17):1747-1754. doi: 10.1001/jama.2020.17020

40. Nierengarten MB. Health literacy may determine treatment choice for favorable-risk prostate cancer: Results from a new trial show that men with low health literacy are less likely to choose active surveillance for prostate cancer after genomic testing. *Cancer*. 2021;127(16):2825-2826. doi: 10.1002/cncr.33784

41. Butler SS, Loeb S, Cole AP, *et al*. United States trends in active surveillance or watchful waiting across patient socioeconomic status from 2010 to 2015. *Prostate Cancer Prostatic Dis*. 2020;23(1):179-183. doi: 10.1038/s41391-019-0175-9

42. Remes O, Mendes JF, Templeton P. Biological, Psychological, and Social Determinants of Depression: A Review of Recent Literature. *Brain Sci*. 2021;11(12):1633. doi: 10.3390/brainsci11121633

43. Friberg AS, Rask Moustsen I, Benzon Larsen S, *et al*. Educational level and the risk of depression after prostate cancer. *Acta Oncol*. 2019;58(5):722-729. doi: 10.1080/0284186X.2019.1566773

44. Dordoni P, Badenchini F, Alvisi MF, *et al*. How do prostate cancer patients navigate the active surveillance journey? A 3-year longitudinal study. *Support Care Cancer*. 2021;29(2):645-651. doi: 10.1007/s00520-020-05524-8

45. Roesch SC, Adams L, Hines A, *et al*. Coping with prostate cancer: a meta-analytic review. *J Behav Med*. 2005;28(3):281-293. doi: 10.1007/s10865-005-4664-z

46. Guan T, Santacroce SJ, Chen DG, Song L. Illness uncertainty, coping, and quality of life among patients with prostate cancer. *Psychooncology*. 2020;29(6):1019-1025. doi: 10.1002/pon.5372

47. Wade J, Donovan J, Lane A, *et al*. Strategies adopted by men to deal with uncertainty and anxiety when following an active surveillance/monitoring protocol for localised prostate cancer and implications for care: a longitudinal qualitative study embedded within the ProtecT trial. *BMJ Open*. 2020;10(9):e036024. doi: 10.1136/bmjopen-2019-036024

48. Andreotti C, Root JC, Ahles TA, McEwen BS, Compas BE. Cancer, coping, and cognition: a model for the role of stress reactivity in cancer-related cognitive decline. *Psychooncology*. 2015;24(6):617-623. doi: 10.1002/pon.3683

49. Spendelow JS, Eli Joubert H, Lee H, Fairhurst BR. Coping and adjustment in men with prostate cancer: a systematic review of qualitative studies. *J Cancer Surviv*. 2018;12(2):155-168. doi: 10.1007/s11764-017-0654-8

50. Yu C, Jingzhen Z, Luqiang Z, Xiaojuan Y, Ji Z. Coping strategies mediate the relationship between fear of cancer recurrence and quality of life in postoperative patients with prostate cancer: a multicentre survey. *BMC Urol*. 2024;24(1):49. doi: 10.1186/s12894-024-01428-5

51. Voerman B, Visser A, Fischer M, Garssen B, van Andel G, Bensing J. Determinants of participation in social support groups for prostate cancer patients. *Psychooncology*. 2007;16(12):1092-1099. doi: 10.1002/pon.1160

52. Wang L, Luo J, Li Y, Zhou Y, Wang W. Social support, anxiety, and depression in patients with prostate cancer: complete mediation of self-efficacy. *Support Care Cancer*. 2022;30(8):6851-6856. doi: 10.1007/s00520-022-07065-8

53. Scandurra C, Muzii B, La Rocca R, *et al*. Social Support Mediates the Relationship between Body Image Distress and Depressive Symptoms in Prostate Cancer Patients. *Int J Environ Res Public Health*. 2022;19(8):4825. doi: 10.3390/ijerph19084825

54. Donachie K, Cornel E, Pelgrim T, *et al*. What interventions affect the psychosocial burden experienced by prostate cancer patients undergoing active surveillance? A scoping review. *Support Care Cancer*. 2022;30(6):4699-4709. doi: 10.1007/s00520-022-06830-z

55. Donachie K, Adriaansen M, Nieuwboer M, Cornel E, Bakker E, Lechner L. Selecting interventions for a psychosocial support program for prostate cancer patients undergoing active surveillance: A modified Delphi study. *Psychooncology*. 2022;31(12):2132-2140. doi: 10.1002/pon.6053

56. Richard J, Rebinsky R, Suresh R, *et al*. Scoping review to evaluate the effects of peer support on the mental health of young adults. *BMJ Open*. 2022;12(8):e061336. doi: 10.1136/bmjopen-2022-061336

57. Baba N, Schrage T, Hartmann A, *et al*. Mental distress and need for psychosocial support in prostate cancer patients: An observational cross-sectional study. *Int J Psychiatry Med*. 2021;56(1):51-63. doi: 10.1177/0091217420938896

58. Ihrig A, Renner T, Muck T, *et al*. Online support groups offer low-threshold backing for family and friends of patients with prostate cancer. *Eur J Cancer Care*. 2019;28(2):e12982. doi: 10.1111/ecc.12982

59. Huber J, Muck T, Maatz P, *et al*. Face-to-face vs. online peer support groups for prostate cancer: A cross-sectional comparison study. *J Cancer Surviv*. 2018;12(1):1-9. doi: 10.1007/s11764-017-0633-0

60. Bender JL, Babinski S, Wong G, *et al*. Establishing best practices in cancer online support groups: protocol for a realist review. *BMJ Open*. 2021;11(11):e053916. doi: 10.1136/bmjopen-2021-053916

61. Livingston PM, Winter N, Russell L, *et al*. Efficacy of an online mindfulness program (MindOnLine) to reduce fear of recurrence in people living with-and beyond-breast, prostate or colorectal cancer: a randomized controlled trial. *EClinicalMedicine*. 2025;86:103373. doi: 10.1016/j.eclinm.2025.103373

62. Hayes BD, Young HG, Atrchian S, *et al*. Optimizing the integration of family physicians into cancer survivorship care in the BC Interior: a mixed methods study of physicians' opinions and experiences. *J Cancer Surviv*. 4, 2025. doi: 10.1007/s11764-025-01751-2

63. Pickles T, Ruether JD, Weir L, Carlson L, Jakulj F, Team SC. Psychosocial barriers to active surveillance for the management of early prostate cancer and a strategy for increased acceptance. *BJU Int*. 2007;100(3):544-551. doi: 10.1111/j.1464-410X.2007.06981.x

64. Thera R, Carr DT, Groot DG, Baba N, Jana DK. Understanding Medical Decision-making in Prostate Cancer Care. *Am J Mens Health*. 2018;12(5):1635-1647. doi: 10.1177/1557988318780851

65. Tiruye T, Beckmann K. Communicating prostate cancer outcomes data to consumers A brief communication. *Urol Oncol*. 2024;42(10):331.e7-331.e11. doi: 10.1016/j.urolonc.2024.05.022

66. Spratt DE, Shore N, Sartor O, Rathkopf D, Olivier K. Treating the patient and not just the cancer: therapeutic burden in prostate cancer. *Prostate Cancer Prostatic Dis*. 2021;24(3):647-661. doi: 10.1038/s41391-021-00328-1

67. Xu E, Liu MA. Psychological interventions for patients living with prostate cancer. *Support Care Cancer*. 2023;31(12):701. doi: 10.1007/s00520-023-08178-4

68. Papadopoulos E, Alibhai SMH, Dore I, *et al*. Associations between self-reported physical activity, quality of life, and emotional well-being in men with prostate cancer on active surveillance. *Psychooncology*. 2020;29(6):1044-1050. doi: 10.1002/pon.5375

69. Merriel SWD, Hetherington L, Seggie A, *et al*. Best practice in active surveillance for men with prostate cancer: a Prostate Cancer UK consensus statement. *BJU Int*. 2019;124(1):47-54. doi: 10.1111/bju.14707

70. Mallapareddi A, Ruterbusch J, Reamer E, Eggly S, Xu J. Active surveillance for low-risk localized prostate cancer: what do men and their partners think? *Fam Pract*. 2017;34(1):90-97. doi: 10.1093/fampra/cmw123

71. Radhakrishnan A, Subramanian L, Rankin AJ, *et al*. Primary Care Physician and Urologist Perspectives on Optimizing Active Surveillance for Low-Risk Prostate Cancer. *Ann Fam Med*. 2024;22(1):5-11. doi: 10.1370/afm.3057

72. Subramanian L, Hawley ST, Skolarus TA, *et al*. Patient perspectives on factors influencing active surveillance adherence for low-risk prostate cancer: A qualitative study. *Cancer Med*. 2024;13(1):e6847. doi: 10.1002/cam4.6847

73. Poort H, Peters M, van der Graaf WTA, *et al*. Cognitive behavioral therapy or graded exercise therapy compared with usual care for severe fatigue in patients with advanced cancer during treatment: a randomized controlled trial. *Ann Oncol*. 2020;31(1):115-122. doi: 10.1016/j.annonc.2019.09.002

74. Pieramico S, Castro R, Aguiar S, *et al*. A systematic review on the efficacy of CBT interventions for the mental and sexual health of survivors of prostate cancer. *Sex Med Rev*. 2024;12(1):48-58. doi: 10.1093/sxmrev/qead024

75. Livingston PM, Russell L, Orellana L, *et al*. Efficacy and cost-effectiveness of an online mindfulness program (MindOnLine) to reduce fear of recurrence among people with cancer: study protocol for a randomised controlled trial. *BMJ Open*. 2022;12(1):e057212. doi: 10.1136/bmjopen-2021-057212

76. Chambers SK, Foley E, Clutton S, *et al*. The role

of mindfulness in distress and quality of life for men with advanced prostate cancer. *Qual Life Res*. 2016;25(12):3027-3035. doi: 10.1007/s11136-016-1341-3

77. Talebiazar N, Anzali BC, Abbasi M, *et al*. Does mindfulness-based stress reduction training have an impact on the occupational burnout and stress experienced by nurses? A randomized controlled trial. *Int Arch Occup Environ Health*. 2025;98(1):1-11. doi: 10.1007/s00420-024-02078-8
78. Teigen A. Mindfulness for depression management in men with prostate cancer. *JAAPA*. 2023;36(3):28-31. doi: 10.1097/01.JAA.0000911220.25098.91
79. Victorson D, Morgan T, Kutikov A, *et al*. Mindfulness-based stress reduction for men on active surveillance for prostate cancer and their spouses: Design and methodology of a randomized controlled trial. *Contemp Clin Trials*. 2023;125:107059. doi: 10.1016/j.cct.2022.107059
80. Malandrone F, Urru S, Berchialla P, *et al*. Exploring the Effects of Variety and Amount of Mindfulness Practices on Depression, Anxiety, and Stress Symptoms: Longitudinal Study on a Mental Health-Focused eHealth System for Patients With Breast or Prostate Cancer. *JMIR Ment Health*. 2024;11:e57415. doi: 10.2196/57415
81. Bourgognon F, Bechet D, Huin-Schohn C, *et al*. A mixed method feasibility and acceptability study of a flexible intervention based on acceptance and commitment therapy for patients with cancer. *Front Psychol*. 2024;15:1409308. doi: 10.3389/fpsyg.2024.1409308
82. Mosher CE, Krueger E, Secinti E, Johns SA. Symptom experiences in advanced cancer: Relationships to acceptance and commitment therapy constructs. *Psychooncology*. 2021;30(9):1485-1491. doi: 10.1002/pon.5712
83. Galvao DA, Newton RU, Girgis A, *et al*. Randomized controlled trial of a peer led multimodal intervention for men with prostate cancer to increase exercise participation. *Psychooncology*. 2018;27(1):199-207. doi: 10.1002/pon.4495
84. Kazer MW, Psutka SP, Latini DM, Bailey DE Jr. Psychosocial aspects of active surveillance. *Curr Opin Urol*. 2013;23(3):273-277. doi: 10.1097/MOU.0b013e32835eff24
85. Kelly BD, Perera M, Bolton DM, Papa N. Social determinants of health: does socioeconomic status affect access to staging imaging for men with prostate cancer. *Prostate Cancer Prostatic Dis*. 2023;26(2):429-431. doi: 10.1038/s41391-022-00508-7
86. Steginga SK, Pinnock C, Gardner M, Gardiner RA, Dunn J. Evaluating peer support for prostate cancer: the Prostate Cancer Peer Support Inventory. *BJU Int*. 2005;95(1):46-50. doi: 10.1111/j.1464-410X.2005.05247.x
87. Langston DM, DePuccio MJ, McAlearney AS, *et al*. Assessment of Patient Experience During Active Surveillance for Prostate Cancer. *J Patient Exp*. 2025;12:23743735251369557. doi: 10.1177/23743735251369557
88. Ilie G, Rendon R, Mason R, *et al*. A Comprehensive 6-mo Prostate Cancer Patient Empowerment Program Decreases Psychological Distress Among Men Undergoing Curative Prostate Cancer Treatment: A Randomized Clinical Trial. *Eur Urol*. 2023;83(6):561-570. doi: 10.1016/j.eururo.2023.02.009
89. Sara SA, Heneka N, Green A, Chambers SK, Dunn J, Terry VR. Effectiveness of educational and psychological survivorship interventions to improve health-related quality of life outcomes for men with prostate cancer on androgen deprivation therapy: a systematic review. *BMJ Open*. 2024;14(5):e080310. doi: 10.1136/bmjopen-2023-080310
90. Donachie K, Hansma M, Adriaansen M, Cornel E, Bakker E, Lechner L. Developing a digital psychosocial support program for men with low-risk prostate cancer during active surveillance. *Internet Interv*. 2025;41:100853. doi: 10.1016/j.invent.2025.100853
91. Loeb S, Curnyn C, Fagerlin A, *et al*. Informational needs during active surveillance for prostate cancer: A qualitative study. *Patient Educ Couns*. 2018;101(2):241-247. doi: 10.1016/j.pec.2017.08.022
92. Shahriari M, Dehghan M, Pahlavanzadeh S, Hazini A. Effects of progressive muscle relaxation, guided imagery and deep diaphragmatic breathing on quality of life in elderly with breast or prostate cancer. *J Educ Health Promot*. 2017;6:1. doi: 10.4103/jehp.jehp_147_14
93. Toussaint L, Nguyen QA, Roettger C, *et al*. Effectiveness of Progressive Muscle Relaxation, Deep Breathing, and Guided Imagery in Promoting Psychological and Physiological States of Relaxation. *Evid Based Complement Alternat Med*. 2021;2021:5924040. doi: 10.1155/2021/5924040

94. Sinha MK, Barman A, Goyal M, Patra S. Progressive Muscle Relaxation and Guided Imagery in Breast Cancer: A Systematic Review and Meta-analysis of Randomised Controlled Trials. *Indian J Palliat Care*. 2021;27(2):336-344. doi: 10.25259/IJPC_136_21

95. Van Blarigan EL, Kenfield SA, Olshen A, *et al*. Effect of a Home-based Walking Intervention on Cardiopulmonary Fitness and Quality of Life Among Men with Prostate Cancer on Active Surveillance: The Active Surveillance Exercise Randomized Controlled Trial. *Eur Urol Oncol*. 2024;7(3):519-526. doi: 10.1016/j.euo.2023.10.012

96. Mishra SI, Scherer RW, Snyder C, Geigle PM, Berlanstein DR, Topaloglu O. Exercise interventions on health-related quality of life for people with cancer during active treatment. *Cochrane Database Syst Rev*. 2012;2012(8):CD008465. doi: 10.1002/14651858.CD008465.pub2

97. McQuade JL, Prinsloo S, Chang DZ, *et al*. Qigong/tai chi for sleep and fatigue in prostate cancer patients undergoing radiotherapy: a randomized controlled trial. *Psychooncology*. 2017;26(11):1936-1943. doi: 10.1002/pon.4256

98. Bilc MI, Pollmann N, Eisenmann C, *et al*. Yoga intervention for colorectal cancer survivors: a qualitative study exploring participants' expectations and experiences. *Ann Med*. 2024;56(1):2397571. doi: 10.1080/07853890.2024.2397571

99. Mansky P, Sannes T, Wallerstedt D, *et al*. Tai chi chuan: mind-body practice or exercise intervention? Studying the benefit for cancer survivors. *Integr Cancer Ther*. 2006;5(3):192-201. doi: 10.1177/1534735406291590

100. Kinney AY, Blair CK, Guest DD, *et al*. Biobehavioral effects of Tai Chi Qigong in men with prostate cancer: Study design of a three-arm randomized clinical trial. *Contemp Clin Trials Commun*. 2019;16:100431. doi: 10.1016/j.conctc.2019.100431

101. He L, Fu Y, Tian Y, *et al*. Antidepressants as Autophagy Modulators for Cancer Therapy. *Molecules*. 2023;28(22):7594. doi: 10.3390/molecules28227594

102. Pan YJ, Kuo KH, Chan HY, McCrone P. Cost-effectiveness and cost-utility of selective serotonin reuptake inhibitors, serotonin norepinephrine reuptake inhibitors, and tricyclic antidepressants in depression with comorbid cardiovascular disease. *J Psychiatr Res*. 2014;54:70-78. doi: 10.1016/j.jpsychires.2014.03.002