

Review

Psychological health challenges and supportive care considerations for gynecological cancer patients during radiotherapy: a narrative review

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Abstract: Background: Gynecological cancer patients frequently experience anxiety, depression, and social isolation, particularly regarding body image, sexual health, fertility, and family roles. Radiotherapy is a central treatment modality and provides a clinically important window for psycho-oncological support. Objective: To synthesize evidence on psychological health challenges and supportive care considerations, including psychosocial interventions, for gynecological cancer patients during radiotherapy. Methods: We conducted a no-systematic narrative review with a structured literature search of PubMed/Medline and Scopus. Four core interventional studies (one randomized controlled trial and three interventional studies) and 54 (58 references cited in total) supporting references were synthesized according to a clinically derived thematic framework. Results: Gynecological cancer patients undergoing radiotherapy commonly experience moderate psychological distress before, during, and after treatment, with additional concerns related to pelvic side effects, sexual dysfunction, brachytherapy, and disrupted family roles. Core evidence indicates that nurse- and peer-led psycho-educational interventions may improve treatment readiness, and informational needs, but should not be interpreted as an evidence-based remedy for psychological distress reduction. Psychosocial interventions including cognitive behavioral therapy, stress management, and structured family support may improve quality of life, but benefits vary by intervention type, cancer subtype, and implementation context. Conclusions: Psychosocial interventions during gynecological cancer radiotherapy show promise but inconsistent benefit. Risk-adapted, radiotherapy-timed, and feasible multidisciplinary approaches are needed. Further high-quality trials are warranted.

Keywords: gynecological cancer patients; psychological health; radiotherapy; psychosocial intervention; quality of life

1. Introduction

The Gynecological (GYN) cancers, including ovarian, cervical, and endometrial cancers, present unique challenges in diagnosis and treatment, significantly impacting patients' psychological well-being. These malignancies often require aggressive treatment strategies, with radiotherapy playing a crucial role, especially in conjunction with surgery and chemotherapy. Radiotherapy aims to eliminate tumor cells, reduce local recurrence rates, and improve survival outcomes; however, it is also associated with various side effects, such as fatigue, skin irritation, and emotional distress. Understanding these challenges is critical for developing effective psychological health management strategies. Integrative approaches, such as nurse-led survivorship care, have shown promise in improving quality of life (QoL) for GYN cancer patients, addressing both physical and psychological needs [1]. Consequently, fostering a supportive environment during radiotherapy not only enhances treatment adherence but also empowers patients to manage the psychological ramifications of their disease and its treatment effectively.

Patients with GYN cancers possess unique psychological health characteristics that set them apart from those suffering from other malignancies. The psychological well-being of these patients is instrumental throughout their treatment journey, profoundly influencing therapeutic efficacy and overall QoL. Studies indicate that individuals with GYN cancers frequently confront a spectrum of psychological challenges, including anxiety, depression, fear, and profound feelings of isolation [2]. Alterations in body image, particularly those stemming from surgical procedures that modify physiological attributes, can elicit feelings of inferiority and anxiety. Moreover, sexual dysfunction emerges as a prevalent concern, deeply affecting patients' emotional lives and intimate relationships. The loss of fertility further burdens younger or childless patients, who may grapple with the inability to fulfill pivotal aspects of their femininity. Shifts in familial roles can engender feelings of diminished worth and status, exacerbating psychological distress. The lack of social support, coupled with the stigma associated with their condition, complicates their ability to seek assistance.

During the course of radiotherapy, the psychological anguish experienced by patients is often intensified, influenced by factors such as tumor staging, household income, and the degree of available support. Therefore, proactive psychological counseling, familial support, and the establishment of effective patient support networks are essential in helping patients navigate the psychological pressures associated with both their illness and its treatment. Tailored care and collaborative efforts from multidisciplinary teams can also offer holistic support to these patients. Nonetheless, the challenge of implementing these interventions more effectively to achieve sustained benefits remains an area that warrants further investigation. This narrative review summarizes the psychological health status of GYN cancer patients undergoing radiotherapy—with particular attention to radiotherapy-specific concerns such as pelvic toxicity, brachytherapy, and the treatment window for intervention—and discusses evidence-based and supportive strategies that may be attempted during radiotherapy care. The evidence base comprises predominantly descriptive and observational literature (53 supporting references) alongside four core interventional studies; recommendations are therefore offered as literature-informed supportive considerations with explicit qualification of evidence strength throughout.

2. Materials and methods: review design and literature search

2.1. Review design and rationale

This manuscript was explicitly designed and reported as a non-systematic narrative review with a structured, topic-guided literature search, reported with attention to transparency principles of the Scale for the Assessment of Narrative Review Articles (SANRA). Database search counts, eligibility notes, and the flow diagram are organizational aids for topic-guided retrieval rather than protocol-driven systematic review procedures. Recommendations should be interpreted as integrative, literature-informed guidance rather than as formal evidence-based clinical practice directives.

The review framework was developed from clinical practice in the Department of Radiation Oncology at Peking University Third Hospital. Theme identification followed a deliberate, practice-derived process: (1) multidisciplinary team discussion among radiation oncologists and nursing staff to identify recurring psycho-oncological concerns during gynecological cancer radiotherapy; (2) mapping of these clinical concerns to provisional review questions (e.g., “What psychological issues arise before, during, and after radiotherapy?” and “What intervention evidence exists specifically during radiotherapy?”); and (3) alignment of manuscript sections

with these questions, with literature searches conducted separately for each thematic domain. This framework prioritizes clinical utility and radiotherapy relevance; it was not designed to exhaustively represent all patient-reported experiences, although patient-reported themes were incorporated where identified in the retrieved literature.

A structured narrative approach was adopted because: (1) the aim was to integrate radiotherapy-specific clinical themes with available literature rather than to answer a single prespecified PICO question—recognizing that systematic reviews can address broad questions when methods permit; (2) only four studies met criteria for core interventional evidence in this population (approximately 7% of cited references), making quantitative pooling inappropriate and limiting the depth of management-focused synthesis; and (3) given this sparse interventional base, the primary contribution is to organize clinically relevant psychological issues during radiotherapy and transparently map available—but limited—intervention evidence onto the care pathway, while identifying gaps that warrant future systematic investigation. This review therefore occupies a defined position as a non-systematic narrative synthesis aligned with SANRA transparency expectations and does not claim the methodological rigor of a systematic review.

2.2. Literature categories

To improve transparency, we distinguished two categories of literature throughout the review:

(1) Core interventional evidence ($n = 4$): studies formally screened and synthesized to evaluate psycho-oncological interventions during gynecological cancer radiotherapy (1 RCT and 3 interventional studies).

(2) Supporting contextual literature ($n = 53$): references cited to support background, psychological characteristics, distress prevalence, mechanisms, engagement factors, implementation considerations, and clinical recommendations.

In total, 57 references are cited (4 core interventional studies + 53 supporting contextual references). The topic-guided retrieval and relevance-check process is summarized in **Figure 1**.

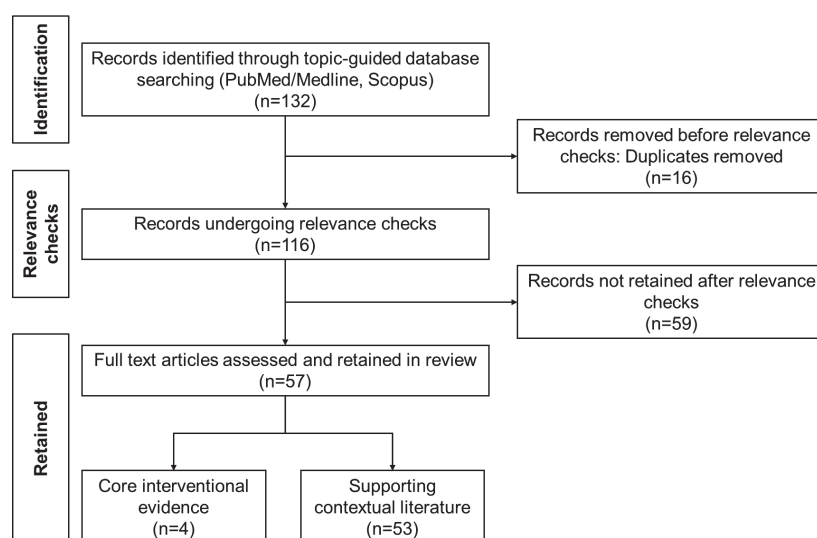


Figure 1. Topic-guided retrieval and relevance-check flow diagram. Records were identified through searches in PubMed/Medline and Scopus. After duplicate removal, titles and abstracts underwent independent relevance checks by two authors. Full-text assessment was performed for studies potentially eligible as core interventional evidence. Four studies (one RCT and three interventional studies) constituted the core interventional evidence base. 53 additional references were retained as supporting contextual literature. In total, 57 references were cited.

2.3. Search strategy

2.3.1. Databases and search period

A structured literature search was conducted in PubMed/Medline and Scopus from database inception to December 31, 2024. No publication date restriction was applied because older publications were considered relevant to brachytherapy and long-standing radiotherapy practice.

2.3.2. Search terms

MeSH and free-text terms combined gynecological cancer (e.g., “gynecologic neoplasms,” “cervical cancer,” “endometrial cancer,” “ovarian cancer”), psychological health (e.g., “psychological distress,” “psycho-oncology,” “quality of life”), and radiotherapy (e.g., “radiotherapy,” “brachytherapy,” “chemoradiotherapy”).

2.3.3. Thematic sub-searches

Supplementary searches were performed for body image and sexual dysfunction; pre-treatment and on-treatment distress; psycho-educational and nurse-/peer-led interventions; cognitive behavioral therapy and stress management; family support; digital/telephone delivery; and engagement factors. Reference lists of key articles were manually screened.

2.4. Eligibility criteria

2.4.1. Core interventional evidence

Inclusion: original interventional studies; gynecological cancer patients undergoing radiotherapy; interventions targeting psychological distress, psychosocial outcomes, QoL, or treatment readiness; English publications. Exclusion: non-English publications; case reports/series; narrative reviews, editorials, and conference abstracts; studies without psycho-oncological outcomes; studies in which radiotherapy was not part of treatment.

2.4.2. Supporting contextual literature

Inclusion: peer-reviewed studies or systematic reviews relevant to psychological health during gynecological cancer radiotherapy. Exclusion: non-English publications; case reports/series; conference abstracts; irrelevant studies.

2.5. Eligibility criteria

Database searches identified 132 records (PubMed/Medline: 78; Scopus: 54). After removal of 16 duplicates, 116 unique records remained. Two authors (MJ and LX) performed independent title/abstract relevance checks for topic-guided retrieval; discrepancies were resolved by consensus with PW when needed. Full-text relevance assessment by WS, YX, LL, and ZM yielded 4 core interventional studies: Schofield et al. (PeNTAGOn RCT [3] and protocol [4]), Rades et al., and Bergin et al. Fifty-three additional references were selected as supporting contextual literature.

2.6. Eligibility criteria

Core study data on design, population, radiotherapy context, intervention, comparator, outcomes, and findings were extracted. Because of heterogeneity, meta-analysis was not performed. Intervention recommendations in Section 6 were categorized by evidence strength, radiotherapy relevance, and feasibility during outpatient radiotherapy.

2.7. Limitations of the review approach

As a non-systematic narrative review with structured searching, this synthesis is

not exhaustive in the manner of a formal systematic review. Risk-of-bias assessment and quantitative pooling were not undertaken. Evidence levels in Section 6.2.3 were assigned using an adapted Oxford Centre for Evidence-Based Medicine (OCEBM) framework. For each intervention–outcome pair we recorded: (i) the highest available study-design level; (ii) population directness (gynecological cancer radiotherapy vs radiotherapy in mixed/non-gynecological cancers vs non-radiotherapy psycho-oncology); (iii) whether the pre-specified primary psychological outcome was met; and (iv) whether intervention detail was sufficient for clinical transfer. A priori downgrade rules: one level for population indirectness; one level when the primary distress-related outcome was non-significant; and the label “Limited–Moderate” when supporting evidence for access/implementation was observational or mixed rather than interventional. Evidence “quality” was therefore operationalized via design level plus directness and primary-outcome success; formal GRADE domain scoring was not performed. Some recommendations rely on expert clinical opinion (OCEBM Level 5) and are identified as such.

3. The current state of psycho-oncological research and psycho-oncological expertise in GYN cancer radiotherapy

Up to now, the relevant studies about psycho-oncology in the context of GYN cancer radiotherapy is relatively few. Mainly, they described psychological and emotional challenges during treatment and evaluated supportive approaches directed either to treatment readiness needs or to distress reduction and QoL—endpoints that should not be conflated. Penelope Schofield et al found that a nurse- and peer-led psycho-educational intervention did not significantly reduce psychological distress compared to usual care for women with GYN cancers receiving radiotherapy, however, it improved treatment readiness and addressed sexuality and health system information [3,4]. These findings support a readiness-focused role for psycho-education and do not establish psycho-education as an evidence-based remedy for distress reduction. D. Rades et al indicated that before radiotherapy, patients with GYN cancers often experience significant emotional distress, including worry, fear, sadness, and depression. The authors suggested that identifying patients with risk factors such as multiple physical problems or no prior surgery can help target those who may benefit from early psycho-oncological interventions [5]. The latest advancements in psycho-oncological research for GYN cancer radiotherapy were summarized in **Table 1**.

Table 1. The latest advancement in psycho-oncological research for GYN cancer radiotherapy.

Advancement	Description
Psychoeducational Interventions	Tailored nursing consultations and peer support to improve psychosocial outcomes [6]
Emotional Distress Support	Identifying at-risk patients for early intervention [5,22,28]
Family Resilience	Reducing psychological distress through family support [7]
Sexual Health	Addressing sexual dysfunction and improving practitioner-patient conversations [8,9]
Digital Health Interventions	Co-created digital tools for ongoing support [10]
Holistic Support	Emphasis on comprehensive support systems [10,11]

4. Psychological health characteristics of GYN cancer patients

Numerous patients undergoing radiotherapy for gynecological cancers encounter a spectrum of psychological issues [12,13]. Compared with many other malignancies, gynecological cancers may be associated with particularly salient concerns related to body image, sexual health, fertility, and stigma—issues that may be further compounded during pelvic radiotherapy.

4.1. Body image and sexual psychology

Alterations in body Image: GYN cancers, particularly those necessitating the excision of organs such as the ovaries or uterus, and those undergoing chemotherapy, frequently lead to substantial changes in patients' body image. This transformation not only affects their physiological functions but may also evoke feelings of lost femininity, culminating in negative emotions such as inferiority, depression and anxiety [14,15]. In contrast, patients with tumors in other anatomical regions may experience fewer direct alterations in body image.

Sexual psychological concerns: Treatments for GYN cancers may result in modifications or loss of sexual function, including diminished libido and discomfort during intercourse. These issues profoundly influence patients' sexual experiences and marital relationships, intensifying their psychological burden [16–18]. Conversely, individuals with tumors in other regions may face fewer sexual psychological challenges unless their malignancy directly impacts sexual organs or related nerves.

4.2. Fertility and family roles

Concerns regarding fertility: For younger or childless women diagnosed with GYN cancers, the potential loss of fertility constitutes a significant emotional setback. They may grapple with feelings of inadequacy in fulfilling essential aspects of their womanhood, accompanied by trepidation and anxiety about the future [19]. Such apprehensions are relatively uncommon among patients with tumors in other locations.

Shifts in familial roles: Treatment for GYN cancers often necessitates that patient temporarily or permanently forgo familial roles, such as those of mother or spouse [20]. This transition can engender feelings of diminished worth and status within the family, potentially triggering psychological issues such as depression and anxiety. In contrast, patients with tumors in other regions may experience fewer direct alterations to their familial roles.

4.3. Social support and stigmatization

Social support: Due to the “unique” characteristics of GYN cancers, these conditions are frequently perceived as “taboo” illnesses in some countries, regions or places. This societal stigma can hinder patients' efforts to seek social support, complicating their ability to disclose their condition and fostering fears of discrimination. In contrast, patients with tumors in other anatomical regions may find it easier to receive social support and understanding.

Stigmatization: The stigma associated with GYN cancers can be particularly pronounced. Patients may harbor concerns that if their condition is revealed, they will face discrimination or ostracism, leading them to conceal their illness or withdraw from social interactions. This stigma further exacerbates their psychological burden [21].

4.4. Psychological responses during treatment

Side effects of treatment: The management of GYN cancers, particularly through

chemotherapy and radiotherapy, is often accompanied by some side effects, including radiation proctitis, cystitis, vaginal stenosis, and vulva and groin skin reactions. These adverse effects not only compromise the patients' physical health but may also amplify their psychological distress. In contrast, patients with tumors in other anatomical regions may confront a different constellation of treatment side effects.

Emotional fluctuations during treatment: Patients with GYN cancers may experience more pronounced emotional fluctuations throughout their treatment journey. They might oscillate between confidence in their therapeutic regimen and despair due to disease recurrence or treatment-related side effects. Such emotional variability calls for heightened attention and support from healthcare professionals and family members.

5. The impact of radiotherapy on the psychological health of GYN cancer patients

5.1. Prevalence of psychological distress among GYN cancer patients during radiotherapy

Psychological distress is commonly experienced by patients undergoing radiotherapy for GYN cancers [22]. The overall psychological distress score for these patients is typically at a moderate level, subject to fluctuations during the course of radiotherapy [23]. Prospective data in cervical and endometrial cancer patients receiving pelvic radiotherapy similarly indicate that health-related quality of life may deteriorate around the end of radiotherapy and improve during follow-up, whereas anxiety and depression scores may remain relatively stable over one year [24]. Factors influencing psychological distress in GYN cancer patients include tumor stage, family income, educational level, degree of bone marrow suppression, Karnofsky Performance Status (KPS), and the level of familial support. Phenomenological studies conducted on patients undergoing concurrent chemoradiotherapy following radical cervical cancer surgery indicate that the experience of psychological distress is complex and multifaceted, necessitating effective mental health service provisions and individualized care plans [25]. Furthermore, correlational analyses regarding the levels of depression and anxiety in patients receiving adjuvant radiotherapy post-cervical cancer surgery provide important clinical insights [26]. The psychological distress experienced by GYN cancer patients during radiotherapy is a complex issue influenced by multiple factors, requiring comprehensive assessment and intervention from various perspectives

5.2. Characteristics of the impact of radiotherapy on the psychological health of GYN cancer patients

Firstly, the universality of psychological distress is notable. GYN cancer patients frequently experience psychological turmoil before, during, and after radiotherapy, manifesting as worry, fear, sadness, tension, anxiety, depression, and feelings of despondency. Their psychological health status may fluctuate across the radiotherapy course [23,27,28]. Longitudinal data also indicate that perceived positive social support can decline over the first year after a cancer diagnosis [29]. In gynecological cancer cohorts, lower family resilience has been associated with greater psychological distress [7]. Secondly, the disease itself, along with physiological changes induced by radiotherapy, can lead to alterations in psychological well-being. For instance, the impact on sexual function and QoL is significant [30,31]. In a one-year prospective gynecologic cohort, pelvic radiotherapy was associated with transient health-related QoL deterioration and body-image changes, with improvement of most

acute complaints during follow-up [24]. In addition, some of the patients with GYN cancers undergoing radiotherapy need brachytherapy treatment, which may contribute different psychological effects on the patients. For example, some patients feel that they have a better chance to be cured, and some patients think that their condition may be more serious. This kind of emotion forms a new cognitive impression on the basis of the disease stage.

Although gynecological cancers are discussed together in this review, the psychological impact of radiotherapy differs across cancer types. For cervical cancer, radiotherapy—often including concurrent chemoradiotherapy and brachytherapy—is frequently central to curative treatment, and distress may be intensified by treatment duration, pelvic symptoms, sexual concerns, and fertility loss [25,26]. For endometrial cancer, radiotherapy is more commonly adjuvant, with a distinct distress trajectory related to surgical recovery and selective radiotherapy indication. For ovarian cancer, radiotherapy is used less frequently; psychological burden more often relates to surgery and chemotherapy, although selected patients receiving adjuvant or palliative pelvic radiotherapy may face concerns similar to other pelvic irradiation recipients. These differences caution against overgeneralization and support cancer subtype-aware psychological assessment during radiotherapy

6. Psychosocial interventions for GYN cancer patients undergoing radiotherapy

6.1. The importance of psychological intervention

Given the widespread emotional distress prevalent prior to radiotherapy, early psychological intervention may alleviate these challenges. Tailored interventions for patients and their partners may enhance psychological well-being and overall QoL, although benefits vary across intervention types [32,33]. Psychological intervention may improve quality of life, reduce distress, alleviate depression and anxiety, and enhance coping strategies and emotional resilience [32–35]. Such interventions may also benefit partners [34]. Radiation therapist-delivered preparatory education can improve preparedness for radiotherapy and reduce pre-treatment distress in radiotherapy cohorts, with population indirectness relative to gynecological cancers [35].

6.2. Measures for psychological intervention

Psychosocial interventions during radiotherapy may improve symptoms of depression and anxiety and overall quality of life (QoL), although the strength of evidence varies across intervention types and gynecological cancer subtypes. Recommendations below are organized according to an adapted OCEBM framework, applied consistently by outcome (**Table 2** and Section 6.2.3). Psycho-educational interventions received differential grading by outcome: High for treatment readiness (PeNTAGOn RCT, Level 1b) and Limited for distress reduction (same trial, no significant primary psychological outcome); psycho-education is therefore not presented as a scientifically established remedy for stress reduction. CBT and stress management were graded Moderate for distress because supporting trials were largely form radiotherapy cohort not restricted to gynecological cancers, an indirectness downgrade from OCEBM Level 2 [36,37]. **Table 2** summary labels (including Moderate versus Limited - Moderate) follow the grading rules in Section 2.7 and are explained intervention-by intervention in Section 6.2.3 when **Table 2** and Section 6.2.3 differ, the latter should prevail. Tier 1 and Tier 2 interventions are distinguished from

Tier 3 clinical opinion suggestions listed separately below.

Table 2. Psychosocial interventions for GYN patients undergoing radiotherapy.

Aspect	Impact	Intervention	Outcome	Evidence level
Psychological Distress	High levels of anxiety and depression during and after radiotherapy	Cognitive behavioral therapy, psycho-educational treatments, stress management training	May reduce distress and improve QoL [36,37]	Moderate
Quality of Life (QoL)	Decreased physical, emotional, and social functioning	Multidimensional and individualized interventions	May improve QoL during/after radiotherapy [38–40]	Moderate (indirect)
Access to Care	Limited access to psycho-oncological treatments for outpatients	Increased availability of psycho-oncological support	May improve coping and compliance [41]	Limited–Moderate
Long-Term Psychological Health	Ongoing issues such as chronic disease and financial difficulties	Regular mental health assessments and tailored interventions	Potential maintenance of benefit; limited evidence [40]	Limited

Note: Evidence levels assigned using an adapted OCEBM framework. Outcome-specific gradings in Section 6.2.3 supersede summary categories where they differ. Psycho-educational interventions: High for treatment readiness, Limited for distress reduction (PeNTAGOn RCT). Grading procedure (intervention-by-intervention): for each Recommendation we recorded (i) highest available OCEBM design level; (ii) population directness to gynecological cancer radiotherapy; (iii) whether the primary psychological outcome was statistically significant; and (iv) sufficiency of intervention/quality detail for transfer. Downgrades: –1 for population indirectness (e.g., CBT from non-gynecological radiotherapy cohorts); –1 when the primary distress endpoint was non-significant (PeNTAGOn); “Limited–Moderate” denotes observational/mixed implementation evidence rather than intervention trial support. Formal GRADE domain scoring was not performed.

6.2.1. Positive psychological counseling and intervention

Interventions based on the PERMA model of positive psychology aim to cultivate positive emotions, relationships, meaning, achievement, and a sense of contribution, thereby enhancing the overall psychological state of patients. Psychological counseling could effectively reduce negative emotions and enhance QoL. Moreover, psychological counseling equips patients to better cope with the psychological pressures and suffering associated with their illness, thereby improving the quality of survival. Theory-driven psycho-educational programs for gynecological cancer patients during the treatment trajectory can reduce illness uncertainty and support aspects of sexual well-being and intimacy, with potential relevance to emotional adjustment and QoL [42].

6.2.2. Family and social support

Family members and friends can provide emotional support through companionship and understanding:

- Emotional support: Radiotherapy may impact a patient’s emotions, prompting them and their loved ones to seek professional psychological support and engage with other patients, thereby helping to manage emotional fluctuations during treatment. The presence and support of family can instill feelings of warmth and care, alleviating

psychological burdens;

- Mitigating negative influences: Studies show that negative psychological states in relatives can precipitate serious psychological disorders in cancer patients, directly affecting treatment outcomes [2,43]. Therefore, caregivers, including family members, must maintain a positive and optimistic demeanor to avoid transmitting negative emotions to patients.
- Fostering confidence and hope: Effective communication between patients and healthcare providers, guided by the physician, is crucial for establishing confidence and hope in overcoming illness. Family and friends can encourage patients daily, helping to instill faith in their ability to combat disease.
- Peer education supported by family: Peer education is significantly effective in alleviating negative emotions. By interacting with others who have undergone similar experiences, patients can gain invaluable insights and emotional support. Family and friends can encourage participation in relevant support groups or activities, aiding patients in managing their emotional challenges.
- Assistance with professional counseling: Through professional counseling, patients can gain a clearer understanding of and strategies for coping with anxiety and depression associated with radiotherapy. Family and friends can assist in locating and utilizing these resources.
- Avoiding excessive pressure: While companionship is essential, family and friends must also be mindful not to impose overwhelming pressure on patients. For instance, a family member resigning from work to provide full-time companionship may inadvertently create additional psychological burdens. Thus, reasonable companionship and moderate support are paramount.

6.2.3. Establishing an effective patient support network: interventions by evidence level

Tier 1: Evidence-supported interventions during gynecological cancer radiotherapy

Cognitive behavioral therapy (CBT) and stress management: CBT and structured stress management may reduce distress and improve QoL among cancer patients undergoing radiotherapy, including formats feasible during daily treatment [36,37]. Evidence level: Moderate after downgrade for population indirectness (source OCEBM Level 2 trials in radiotherapy-treated patients, not gynecological-cancer - specific radiotherapy cohorts). Rationale: benefit signals in radiotherapy contexts but certainty is reduced because the pivotal evidence is not gynecological radiotherapy – specific, quality considerations were limited to study design and outcome directness rather than formal GRADE scoring. Feasibility during radiotherapy: High.

Psycho-educational and nurse-/peer-led interventions: The PeNTAGOn RCT found that nurse- and peer-led psycho-education did not significantly reduce distress versus usual care but improved treatment readiness and addressed sexuality and health-system information needs [3,4]. Evidence level: High (OCEBM Level 1b) for treatment readiness needs; Limited for distress reduction (primary psychological outcome non-significant). Rationale: readiness and distress-reduction intervention on the basis of PeNTAGOn. Feasibility: High.

Early identification of high-risk patients: Pre-treatment screening for emotional distress and risk factors may help target early support [5,22,28]. Evidence level: Moderate. Feasibility: High.

Relaxation techniques: Breathing exercises and guided relaxation have supportive evidence in radiotherapy contexts [37]. Evidence level: Moderate.

Feasibility: High.

Tier 2: Interventions with indirect or limited evidence in this population

Multidimensional individualized interventions may improve QoL in cancer patients receiving radiotherapy, although gynecological cancer-specific validation remains limited [38–40]. Family and caregiver support may influence distress and engagement [7,34,44]. Peer support, physical activity/yoga, and online/telephone delivery show promise but have limited direct evidence in gynecological cancer radiotherapy [6,45,46].

Tier 3: Clinical supportive suggestions (expert opinion; not evidence-based in gynecological cancer radiotherapy)

The strategies below represent clinical supportive suggestions drawn from broader psycho-oncology and self-management literature. They are not validated in gynecological cancer radiotherapy trials and should not be interpreted as evidence-based treatment recommendations. They are listed separately from Tier 1 and Tier 2 to avoid confusion with interventions supported by direct or indirect research evidence: emotional expression and sharing; positive thinking and gratitude practices; journaling; distraction techniques; self-awareness and acceptance of emotions; and dialectical perspectives. Evidence level: Expert opinion (OCEBM Level 5). Feasibility: High, but therapeutic benefit requires future validation in this population.

6.2.4. Personalized care

Personalized care plans integrating health education, psychological support, skin care, and nutritional guidance may help reduce emotional burden during radiotherapy. Such plans should be developed through multidisciplinary collaboration and adapted to cancer subtype, treatment intensity (external beam vs. brachytherapy), performance status, and social support availability. Evidence level: Moderate (clinical and observational support; limited trial data in gynecological cancer radiotherapy).

7. Factors influencing GYN cancer patients' engagement in psychosocial interventions

Understanding the factors that affect GYN cancer patients' participation in psychosocial interventions and implementing proactive strategies can help tailor psychosocial interventions to better meet the needs of GYN cancer patients, thereby improving their engagement and overall well-being associated with the illness and radiotherapy.

These factors can be broadly categorized into individual characteristics, social support, psychological factors and intervention-related factors, as summarized in **Table 3**.

Table 3. Factors influencing GYN cancer patients' engagement in psychosocial interventions.

Factor	Influence on engagement
Marital Status	Married patients more likely to participate with caregivers [44]
Income and Insurance	Lower income and Medicaid insurance linked to non-spousal caregiver involvement [44]
Quality of Life	Poorer quality of life increases benefits from interventions [47]
Emotional Expressiveness	Higher emotional expressiveness linked to greater benefits [47]
Caregiver Involvement	Presence of caregivers, especially non-spousal, increases participation [43,45]

Continuation Table:

Factor	Influence on engagement
Patient-Provider Communication	Effective communication and trust reduce distress and improve engagement [48,49]
Medical Mistrust	Higher mistrust linked to more anxiety and depression, affecting participation [49]
Self-Efficacy	Higher self-efficacy associated with lower distress and better engagement [49]
Intervention Format	Online and telephone interventions show promise but results vary [45,46]
Perceived Value	Patients engage more if they find the intervention valuable and tailored to their needs [50]

8. Challenges and recommendations

There is considerable variation in the implementation of psycho-oncological care across different centers. Standardizing practices and developing consensus guidelines are essential for improving care quality [51–53]. Besides, Addressing the full spectrum of psychosocial needs, including emotional, sexual, and supportive care, is crucial for improving the overall well-being of GYN cancer patients [54,55].

9. Discussion

This narrative review synthesizes evidence on psychological health challenges and supportive care considerations during gynecological cancer radiotherapy, emphasizing radiotherapy-specific distress trajectories, intervention feasibility during treatment, and the limited interventional evidence base.

A major finding from the core interventional evidence is the contrast between improved treatment readiness and absent distress reduction in the PeNTAGOn RCT [3]. Because the primary psychological-distress endpoint was not met, PeNTAGOn should not be over-interpreted as establishing psycho-education as a scientifically validated stress-reduction therapy. Its clinical relevance rests on secondary gains in treatment readiness and unmet informational, sexual, and health-system needs, which are distinct from distress reduction. Psycho-educational interventions may address informational, sexual, and systems-navigation needs without necessarily reducing global distress scores. Possible explanations for absent distress effects include insufficient intervention intensity, overlap with usual supportive care, outcome measure insensitivity, heterogeneous patient needs, and timing of assessment relative to treatment-related distress peaks.

Available evidence suggests that psychosocial interventions may improve QoL and coping, but benefits are inconsistent across populations and intervention formats [3,36–40,56]. Heterogeneity is likely influenced by cancer subtype (cervical vs. endometrial vs. ovarian), treatment modality (chemoradiotherapy, brachytherapy, adjuvant radiotherapy), baseline distress, caregiver involvement [44], and patient engagement factors [50]. Risk-adapted approaches targeting patients with high pre-treatment distress [5], limited family support, or significant sexual and body image concerns may be more efficient than universal interventions.

Implementation barriers remain substantial in real-world radiotherapy practice. Outpatient psycho-oncological services are often limited to brief consultations addressing information deficits rather than structured psychotherapy [57]. Additional

constraints include staffing shortages, time pressures during daily radiotherapy, financial barriers, geographic access, caregiver burden, and variable patient adherence.

Digital and remotely delivered psycho-oncological support may improve access for patients attending repeated outpatient radiotherapy appointments [10,48,49]. Co-created digital tools for gynecological cancer survivorship have shown promise. However, digital interventions cannot fully replace empathic face-to-face counseling for complex emotional, sexual, and relational concerns. Artificial intelligence (AI)-supported tools may serve as adjuncts for information delivery and self-management support, but were not a prespecified focus of this review and should not be viewed as substitutes for clinician-led psycho-oncological care.

Pelvic radiotherapy raises distinctive long-term concerns, particularly sexual dysfunction and body image changes, requiring attention before, during, and after treatment [8,9,30]. Brachytherapy may produce divergent emotional responses, with some patients interpreting it as curative intensification and others as a sign of disease severity.

Limitations include the small core interventional evidence base (four studies, representing approximately 7% of cited references), reliance on observational and mixed-cancer supporting literature, and the inherent constraints of a non-systematic narrative review (no exhaustive identification of all studies or formal risk-of-bias appraisal). The title emphasizes psychological health challenges and supportive care considerations rather than management efficacy, reflecting that much of the evidence base is descriptive or observational, with limited interventional data. Tier 3 recommendations in Section 6.2.3 are expert clinical opinion rather than evidence-based in this population.

Future research should prioritize adequately powered RCTs in gynecological cancer radiotherapy with clearly defined endpoints (distress, QoL, sexual health, treatment adherence, and readiness), subgroup analyses by cancer type and treatment modality, implementation-focused designs, and longer follow-up beyond the acute treatment period.

10. Conclusion

Supportive psychosocial approaches during gynecological cancer radiotherapy remain promising but inconsistently evidenced. Nurse-/peer-led psycho-education is best supported for treatment readiness and information needs rather than for distress screening, CBT-oriented strategies ((largely from indirect radiotherapy evidence), family involvement, and personalized multidisciplinary care may be relevant during the radiotherapy window, although none should be assumed universally effective. Sexual health and pelvic treatment sequelae remain critical priorities that require attention before, during, and after treatment. Risk-adapted, feasible, and cancer subtype-aware implementation is essential. Currently, no unified evidence-based model exists for optimizing quality of life across all patient subgroups. High-quality interventional research remains urgently needed to define which interventions work, for whom, and under what implementation conditions.

Abbreviations: AI, Artificial Intelligence; CBT, Cognitive behavioral therapy; GYN, Gynecological; KPS, Karnofsky Performance Status; MeSH, Medical Subject Heading; OCEBM, Oxford Centre for Evidence-Based Medicine; PERMA, Positive psychology model; PICO, PICO framework; QoL, Quality of life; RCT, Randomized Controlled Trial; SANRA, Scale for the Assessment of Narrative Review Articles.

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