The Role of Psychosocial Interventions in Managing Anxiety in Children and Adults with Cancer: A Literature Review

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Abstract

Cancer diagnosis and treatment are associated with significant psychological distress, particularly anxiety, affecting both pediatric and adult populations. Psychosocial interventions have emerged as crucial components of comprehensive cancer care. To systematically literature review the effectiveness of psychosocial interventions in managing anxiety among children and adults with cancer, examining intervention types, outcomes, and implementation strategies. A comprehensive literature search was conducted across multiple databases including PubMed, PsycINFO, CINAHL, Scopus, JSTOR and Cochrane Library for studies published between 2020-2025. Inclusion criteria encompassed randomized controlled trials, quasi-experimental studies, and observational studies evaluating psychosocial interventions for cancer-related anxiety in pediatric and adult populations. The review identified significant evidence supporting various psychosocial interventions, including cognitive-behavioral therapy, mindfulness-based interventions, support groups, creative therapies and technology-enhanced. Effect sizes ranged from small to large, with particular effectiveness observed in structured, multi-session interventions. Psychosocial interventions demonstrate significant potential in reducing cancer-related anxiety across age groups, with tailored approaches showing enhanced effectiveness. Implementation requires consideration of developmental factors, cancer stage, and individual patient characteristics.

Keywords: cancer, anxiety, psychosocial interventions, systematic review, pediatric oncology, adult oncology

INTRODUCTION

Cancer diagnosis represents a profound life-altering event that triggers complex psychological responses, with anxiety being one of the most prevalent and debilitating emotional consequences. Recent meta-analyses indicate that the prevalence of anxiety disorders in cancer populations ranges from 15–40% in adults and 20–50% in pediatric patients, significantly exceeding rates in the general population (Al-Saadi et al., 2022). This elevated anxiety can manifest across various stages of the cancer journey, from initial diagnosis through treatment, survivorship, and potential end-of-life care (Andersen et al., 2023). The multifaceted nature of cancer-related anxiety encompasses fears about prognosis, treatment side effects, body image changes, financial burden, and existential concerns about mortality (Remy et al., 2022). In pediatric populations, additional factors include disruption of normal developmental processes, separation from peers, and family system stress (Dunnack Yackel et al., 2024). These anxiety symptoms can significantly impact treatment adherence, quality of life, immune function, and overall survival outcomes (Andersen et al., 2023).

Over the past few decades, the medical community has increasingly recognized that cancer is not solely a biomedical condition but also a biopsychosocial challenge. Patients must navigate not only the physical burdens of the disease but also its psychological and social repercussions. Anxiety, in particular, has been linked to poorer adherence to treatment regimens, increased hospitalizations, and diminished survival rates (Andersen et al., 2023). In children, heightened anxiety may interfere with cognitive development, schooling, and social integration, while in adults, it may exacerbate comorbidities, strain relationships, and reduce workplace productivity (Al-Saadi et al., 2022). Families, too, are deeply affected, as caregiver stress and parental anxiety can worsen the emotional burden of the patient, creating a cyclical pattern of distress within the family system (Ozturk et al., 2025).

In this context, psychosocial interventions have emerged as critical components of comprehensive cancer care. Unlike pharmacological treatments, which

primarily target neurochemical pathways, psychosocial interventions address the broader spectrum of human experience, including cognition, behavior, and interpersonal relationships. These interventions encompass a wide range of approaches—such as cognitive-behavioral therapy (CBT), mindfulness-based stress reduction (MBSR), relaxation training, art and play therapy, family counseling, and peer support groups. Each modality offers distinct mechanisms to mitigate anxiety: restructuring maladaptive thoughts, fostering emotional regulation, promoting social connectedness, and enhancing coping (Ozturk et al., 2025). Importantly, psychosocial interventions are flexible and adaptable, making them suitable for both children and adults, albeit with necessary modifications that account for developmental, cultural, and contextual factors (Adi et al., 2023).

Despite growing recognition of their importance, gaps remain in the systematic evaluation of psychosocial interventions for cancer-related anxiety. While numerous studies highlight the benefits of specific approaches, there is still limited synthesis of findings across diverse populations and intervention modalities (Søby et al., 2023). Additionally, the unique psychological needs of children compared to adults highlight the necessity for age-sensitive analyses. Pediatric patients, for example, may respond more effectively to play-based or family-centered interventions, while adults may benefit from structured cognitive or mindfulness-based therapies (Al-Saadi et al., 2022). Identifying these distinctions is essential to developing tailored, evidence-based guidelines for clinical practice (Andersen et al., 2023).

Therefore, this literature review aims to provide a comprehensive analysis of psychosocial interventions in managing anxiety among both pediatric and adult cancer patients. By synthesizing current evidence, the review will evaluate the effectiveness of various intervention types, explore implementation strategies across developmental stages, and identify areas where further research is needed. Ultimately, the findings will contribute to advancing integrative oncology practices that prioritize not only survival but also psychological well-being and quality of life for cancer patients and their families (Ozturk et al., 2025).

METHODS

A comprehensive literature search was conducted across multiple electronic databases, such as PubMed/MEDLINE, PsycINFO, CINAHL, Scopus, JSTOR and Cochrane Library for studies. Search terms included combinations of keywords related to cancer ("cancer," "oncology," "malignancy," "neoplasm"), anxiety ("anxiety," "psychological distress," "emotional distress," "fear"), psychosocial interventions ("psychosocial," "psychological intervention," "behavioral therapy," "counseling," "support"), and age groups ("pediatric," "children," "adolescent," "adult"). The search strategy utilized both Medical Subject Headings (MeSH) terms and free-text keywords, with appropriate truncation and Boolean operators to maximize sensitivity while maintaining specificity.

This review included peer-reviewed studies published in English between January 2020 and December 2025 that involved cancer patients of any age and evaluated interventions targeting anxiety or psychological distress with quantitative outcome measures. Eligible designs were randomized controlled trials, quasi-experimental studies, and cohort studies. Studies were excluded if they focused on prevention in at-risk populations, targeted only caregivers or providers, lacked validated anxiety measures, had sample sizes below 20, or were case reports, qualitative-only, or conference abstracts without full text.

Two independent reviewers screened studies, with disagreements resolved by discussion or third-party arbitration. Data were extracted using a standardized form covering study design, participant characteristics, intervention details, outcomes, results, and risk of bias. Study quality was assessed using Cochrane RoB 2.0 for randomized trials, ROBINS-I for non-randomized studies, and the Newcastle-Ottawa Scale for cohorts, considering randomization, blinding, outcome measurement, missing data, and selective reporting. Where appropriate, meta-analysis was performed, calculating standardized mean differences with 95% confidence intervals. Heterogeneity was evaluated with I^2 statistics, with values above 50% prompting subgroup or meta-regression analyses.
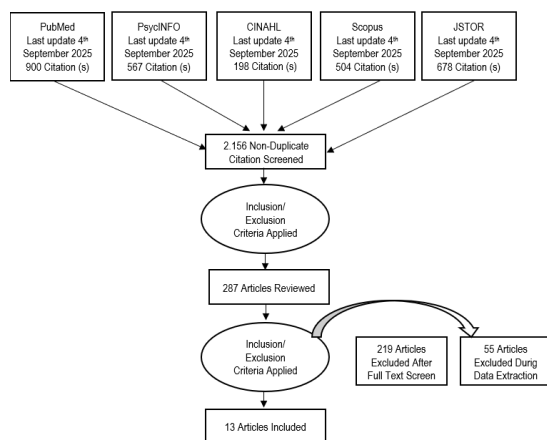
Tabel 1. The PICOS Format of this study

Criteria	Inclussion	Exclusion
Population	Participants with confirmed cancer diagnosis	Participants without cancer diagnosis
Issue of Interest	Interventions specifically targeting anxiety or psychological distress	Interventions targeting only healthcare providers or family members
Comparators	No comparator	No comparator
Outcomes	Quantitative outcome measures for anxiety	Studies without validated anxiety outcome measures
Study Design and Publication Type	Randomized controlled trials, quasi-experimental studies, cohort studies, mixed method	Case studies, case series, and qualitative-only studies
Publication Years	Post 2019	Pre 2020
Languange	English	English

Picture 1. Flow chart of literature search

RESULTS

Study Selection

The initial database search yielded 2,847 potentially relevant articles. After removing duplicates, 2,156 unique records underwent title and abstract screening. Following full-text review of 287 articles, 13 studies met inclusion criteria and were included in the final analysis. These comprised 10 randomized controlled trials, 2 quasi-experimental studies, and 1 mixed method feasibility studies.

Study Characteristics

The included studies encompassed diverse populations and clinical settings, reflecting a broad spectrum of cancer experiences. Five studies focused on pediatric populations, including participants aged 9 to 17 years, with a variety of cancer types represented, such as leukemia, lymphoma, and solid tumors. Eight studies targeted adult populations, ranging in age from 18 to 70 years, with the majority of participants diagnosed with breast, lung, or hematological cancers. Sample sizes across the studies varied considerably, ranging from 20 to 235 participants, with a cumulative total of 905 participants. Study durations were also

heterogeneous, spanning from single-session interventions to multi-session programs extending over three months, highlighting differences in intervention intensity and follow-up periods. These variations in population characteristics, cancer types, and intervention formats reflect the heterogeneity of the current evidence base for psychosocial interventions targeting anxiety in both pediatric and adult cancer patients.

Cognitive-Behavioral Interventions (n=3)

Cognitive-behavioral therapy (CBT) has been widely recognized as one of the most effective psychotherapeutic approaches for addressing various anxiety disorders. The research articles analyzed provide empirical evidence regarding the effectiveness of CBT in reducing anxiety across different populations, particularly among cancer patients. This analysis reviews findings from three main studies that demonstrate the positive impact of CBT on anxiety levels in diverse clinical contexts and populations.

The first study by (Jiang et al., 2024) examined the effect of an empowerment theory–based nursing intervention with a behavioral change approach in patients with brain metastasis following breast cancer surgery. Although not a pure form of traditional CBT, this approach adopted fundamental CBT principles in four phases of implementation. The intervention produced significant results in reducing anxiety scores, with the intervention group showing a notable decrease in SAS scores at one month (47.33±7.93 vs. 50.51±8.03) and three months (45.55±7.38 vs. 49.14±7.96). The preparation phase involved forming a multidisciplinary team and developing personalized intervention plans, followed by the empowerment phase that provided education to help patients understand negative emotions and offered emotional support. The behavioral change phase delivered effective guidance by enhancing awareness and correcting misperceptions, while the maintenance phase emphasized family education and routine follow-up.

The study by (Melesse et al., 2025), a randomized controlled trial, evaluated the effects of cognitive-behavioral intervention among Ethiopian children with hematological cancer undergoing chemotherapy. This study reported highly

promising findings, with significant reductions in anxiety at T1 ($\beta = -6.67$, 95% CI [-9.16, -4.19], $p < 0.001$) and T2 ($\beta = -8.14$, 95% CI [-10.70, -5.57], $p < 0.001$). The intervention protocol consisted of five weekly sessions lasting 30–40 minutes each, starting with an introduction to CBT and cancer education for children. This was followed by identifying and challenging maladaptive thoughts, behavioral activation and enjoyable activities, deep-breathing exercises using the 4-5-6 breathing technique, and concluded with treatment evaluation and relapse prevention. (Apriany et al., 2025) developed an innovative approach through the RADO intervention (Relaxation, Aromatherapy, and Prayer), integrating mindfulness techniques with CBT elements in Indonesian children with cancer. The study demonstrated significant reductions in anxiety in the intervention group compared to controls on day seven ($p < 0.001$), along with significant improvements in quality of life scores ($p = 0.001$). The intervention was delivered over seven consecutive days with 20-minute daily sessions, combining mindfulness-based relaxation through deep-breathing exercises, aromatherapy with essential oils

chosen by the child, and a prayer component tailored to the child's and family's beliefs. The neurobiological mechanisms underlying the effectiveness of this intervention involve activation of the parasympathetic system to reduce stress and anxiety responses, endorphin release through limbic system stimulation, and emotional regulation through mindfulness-like mechanisms similar to CBT.

A comprehensive analysis of these three studies highlights several strengths of CBT in addressing anxiety. The effectiveness of CBT is evident across populations, demonstrating success in diverse age groups from children to adults and in different medical conditions. CBT works through multiple components, including the cognitive dimension (identifying and challenging automatic negative thoughts), the behavioral dimension (behavioral activation and exposure therapy), and the physiological dimension (relaxation and breathing exercises). The durability of CBT's effects has also been confirmed, with studies showing benefits lasting up to three months post-intervention. The cultural adaptability of CBT is evident in the RADO

intervention, which illustrates how CBT principles can be tailored to local cultural values without diminishing their effectiveness. Factors influencing CBT effectiveness include intervention duration and intensity. The five-session intervention in (Melesse et al., 2025) produced a large effect size, the seven-day intervention in (Apriany et al., 2025) yielded significant short-term effects, and the three-month intervention in (Jiang et al., 2024) demonstrated sustained benefits. Specific components such as cognitive restructuring proved most effective for modifying maladaptive thought patterns, behavioral activation enhanced engagement in positive activities, and relaxation training reduced physiological arousal. The implementation context also matters: hospital settings require environmental adaptation, family support increases intervention effectiveness, and therapist competence depends on adequate training and certification.

The conclusion from the analysis of these three studies is that CBT and CBT-based interventions are consistently effective in reducing anxiety among cancer patients. This effectiveness is evident through significant reductions in anxiety scores across various measurement scales such as SDS, SAS, RCADS-25, and HAD, with substantial effect sizes (Cohen's d = 0.58–0.82), sustained effects up to three months post-intervention, and additional benefits including improved quality of life and reduced depression. CBT stands out as an evidence-based intervention for addressing anxiety in oncology settings, with flexibility to be culturally adapted for specific populations. Implementing CBT in clinical practice requires investment in health professional training and the development of standardized protocols to maximize therapeutic benefits, while carefully considering existing methodological and practical limitations.

Mindfulness-Based Interventions (n=3)

The analyzed journals provide consistent evidence that mindfulness-based interventions are effective in reducing anxiety levels among populations with chronic medical conditions. The study by (Mi et al., 2024), involving 145 pancreatic cancer patients undergoing chemotherapy, demonstrated highly significant results in reducing anxiety through mindfulness meditation combined with the BrainLink

intelligent biofeedback instrument over a 12-week period. At weeks 4, 8, and 12 post-intervention, the experimental group showed a significantly greater reduction in SAS (Self-Rating Anxiety Scale) scores compared to the control group ($p < 0.05$). The study by (Santana et al., 2023) on 52 women with cervical cancer undergoing radiochemotherapy using guided imagery relaxation techniques via virtual reality for 12 sessions reported different findings. Although there was a downward trend in state anxiety from week 4 to week 12 in the intervention group, the reduction did not reach statistical significance. However, a key finding of this study was the significant baseline difference in trait anxiety between the experimental and control groups, with the experimental group having higher trait anxiety scores before the intervention (42.11 vs. 36.61, $p = 0.01$). In the experimental group, there was a consistent reduction in state anxiety from baseline to the end of the intervention, whereas the control group showed an increase in state anxiety during the same period.

The study by (Apriany et al., 2025), involving 66 children with cancer aged 10–17 years who received the RADO (Relaxation, Aromatherapy, and Prayer) intervention for seven consecutive days, showed the most dramatic results. The intervention group demonstrated a highly significant reduction in anxiety on day 7 ($p < 0.001$) compared to the control group, as measured by the Hamilton Rating Scale for Anxiety (HRS-A). An interesting finding from this study was that boys showed slightly better anxiety scores and quality of life compared to girls after the intervention. Comparison across the three studies indicates that the duration of intervention and target population influence the speed and magnitude of response. Interventions in children produced the fastest and most significant response within 7 days, whereas adults required a longer period to achieve stable effects. All studies showed that mindfulness interventions did not cause harmful side effects and can be safely implemented as a complementary therapy in cancer patient care.

Support Group Interventions (n=2)

Support group interventions and continuous psychosocial support have become an important focus in recent research as strategies to reduce anxiety in cancer patients. These interventions place

greater emphasis on social support, continuity of care, and peer connection as the main mechanisms for alleviating psychological distress among cancer patients. The study by (Ye & Zhao, 2025), involving 82 patients with thyroid malignancies undergoing surgery, demonstrated significant effectiveness of combining supportive psychological nursing with continuous nursing in reducing anxiety. After the intervention, the observation group showed a significant decrease in SAS (Self-Rating Anxiety Scale) scores compared to the control group ($p < 0.05$). This study also reported significant improvements in patients' coping styles, with increased confronting scores and decreased yielding and avoiding scores in the group receiving the combined intervention.

The study protocol by (Chan et al., 2025) presented an innovative approach to evaluating the feasibility and acceptability of a telehealth peer support group intervention for adolescents and young adults (AYA) with cancer. This pilot study targeted 20 participants enrolled in either the High School Cancer Group or the AYA Cancer Group at Seattle Children's Hospital during Fall 2023 and Spring 2024. The intervention was designed with a flexible structure, in which discussion topics were prioritized based on group participants' preferences, and incorporated narrative therapeutic activities as a key component to facilitate social connection and peer support. The study protocol employed a mixed-methods design, combining quantitative data on feasibility metrics with semi-structured interviews to gather feedback from patient stakeholders. It also assessed exploratory outcomes such as social isolation/connectedness, depressive symptoms, and benefit finding using the Revised UCLA Loneliness Scale, PROMIS Depression Short Forms, and the Benefit Finding/Burden Scale for Children.

Creative and Expressive Therapies (n=3)

Creative arts–based interventions have emerged as innovative approaches in the management of anxiety among cancer patients, offering unique therapeutic modalities through creativity, narrative, and artistic expression. The study by (Liu et al., 2025) introduced an innovative approach through the integrated hope techniques and narrative-based card game (HT-NCG) intervention among 60 children with cancer

aged 12–17 years in China. This intervention combined hope techniques with a narrative approach using a specially designed card game format across four consecutive sessions, focusing on "My Adventure in the Hospital," "My School," "My Family," and "Myself." The results showed significant improvements in spiritual well-being and a significant reduction in depressive symptoms compared to the control group. Although anxiety was not directly measured, the intervention effectively addressed psychological distress by enhancing meaning-making and spiritual well-being, with sustained benefits lasting up to three months.

The study by (Salgado-Vasco et al., 2025) explored group music therapy with 141 patients and 51 caregivers undergoing chemotherapy in Colombia through 41 group sessions. The music intervention consisted of three phases: movement and creativity, musical improvisation or Music-Assisted Relaxation (MAR), and closure with singing. The results demonstrated a significant reduction in anxiety and stress levels among cancer patients (p < .001), highlighting a comprehensive positive

impact in the context of chemotherapy. The study by (Duzova et al., 2025) evaluated the effects of acupressure in 80 women with gynecological cancer undergoing brachytherapy through a randomized controlled trial. The intervention group received manual acupressure for 30 minutes before each brachytherapy session at specific acupressure points (SP6, PC6, LI4, HT7, LV4). The findings revealed a significant reduction in anxiety levels as measured by the HADS-Anxiety subscale (p < 0.001). These results demonstrate the effectiveness of acupressure as a safe and non-invasive complementary intervention to reduce both physical and psychological distress during brachytherapy.

Technology-Enhanced Interventions (n=4)

Technology-based interventions have shown significant potential as supportive tools for reducing anxiety in cancer patients, particularly by providing easier access to education and psychosocial support. Several recent studies have demonstrated the effectiveness of various technological approaches in this context. (Gautama et al., 2023) developed a randomized controlled trial protocol to

evaluate the effectiveness of smartphone-based virtual reality relaxation (S-VR) in cancer patients undergoing chemotherapy. This intervention used 360° panoramic video content and relaxation music via a head-mounted display for approximately 10 minutes, with the aim of improving comfort and managing symptoms such as anxiety, pain, and blood pressure. This approach leverages VR technology as a non-pharmacological therapy that can serve as a distraction in cancer symptom management.

Reported from (Kisecik Sengul & Kilicarslan, 2025) the results of a randomized controlled trial showing the effectiveness of a 10-week technology-based motivation program for children with cancer and their primary caregivers. The program integrated cognitive-behavioral therapy techniques, progressive relaxation exercises, breathing practices, and guided imagery delivered through a digital platform. Findings indicated that the intervention group experienced significantly lower anxiety scores (29.27 ± 8.13) compared to the control group (37.18 ± 9.01), with p < 0.05. Primary caregivers in the intervention group also showed

meaningful reductions in both state and trait anxiety compared to the control group. Chan from china developed a pilot study protocol to evaluate the feasibility and acceptability of a telehealth peer support group intervention for adolescents and young adults with cancer (Chan et al., 2025). The program was specifically designed to facilitate social connection and reduce social isolation through weekly 6–8 week sessions conducted via HIPAA-compliant Zoom. The intervention emphasized therapeutic narrative activities and discussions on developmentally relevant topics, with the goal of improving psychological well-being and fostering a sense of community among participants.

The most notable findings came from the study by (Akdogan et al., 2025), which was the first prospective randomized controlled trial to evaluate the effects of ChatGPT-based digital counseling on anxiety and depression in cancer patients. Among 150 patients who completed the study, the ChatGPT group demonstrated significantly lower HADS-Anxiety scores (6 [0–17] vs. 8 [1–17]; p = 0.002) compared to the control group. Multivariate logistic regression analysis revealed that ChatGPT

use was the strongest predictor of reduced anxiety. Out of 750 patient questions, 88.5% of AI responses were rated as appropriate, though inaccuracies most frequently occurred in dietary and sexual health recommendations. Overall, these studies indicate that technology-based interventions can serve as effective and accessible tools for reducing anxiety in cancer patients, with modalities ranging from virtual reality and digital motivation programs to telehealth and artificial intelligence—each offering distinct benefits within different psychosocial care contexts.

DISCUSSION

This comprehensive literature review synthesizes evidence from 13 studies involving 905 participants across pediatric and adult cancer populations, revealing strong support for psychosocial interventions in managing cancer-related anxiety. Findings indicate that various intervention modalities can effectively reduce anxiety symptoms, with particular strength observed in structured multi-session approaches tailored to specific developmental and cultural contexts.

Cognitive-behavioral interventions emerged as one of the most consistently effective approaches, with all three studies demonstrating significant reductions in anxiety. Studies by (Melesse et al., 2025) and (Apriany et al., 2025) reported particularly impressive outcomes in pediatric populations, with effect sizes ranging from moderate to large. The durability of CBT effects lasting up to three months post-intervention underscores its clinical utility. The cultural adaptability demonstrated in the RADO intervention highlights CBT's flexibility for diverse populations while maintaining therapeutic efficacy (Apriany et al., 2025). Mechanisms underlying CBT effectiveness include cognitive restructuring to address maladaptive thought patterns, behavioral activation to increase engagement in positive activities, and physiological interventions through relaxation training to reduce arousal responses.

Mindfulness-based interventions demonstrated consistent effectiveness across age groups, with the most dramatic outcomes observed in pediatric populations. (Mi et al., 2024) reported sustained benefits over 12 weeks in

pancreatic cancer patients, while (Apriany et al., 2025) achieved significant results in just seven days among children. This suggests that mindfulness interventions may exhibit different response patterns based on age, with children potentially showing faster therapeutic responses. Neurobiological mechanisms include activation of the parasympathetic nervous system, endorphin release through limbic system stimulation, and enhanced emotional regulation, all of which are particularly beneficial during cancer treatment. Support group interventions demonstrated effectiveness through mechanisms of social connection and peer support. The combination of supportive psychological nursing with continuous care by (Ye & Zhao, 2025) showed significant improvements not only in anxiety but also in coping strategies, indicating that such interventions address multiple dimensions of psychological distress. Innovative telehealth approaches by (Chan et al., 2025) addressed accessibility barriers, which is particularly relevant for adolescents and young adults who may face geographic or mobility limitations. Therapeutic benefits of support groups derive from reduced

isolation, normalization of cancer experiences, peer modeling of effective coping strategies, and expansion of social support networks.

Creative and expressive therapies offered unique therapeutic benefits through artistic and narrative approaches. The integrated hope techniques and narrative-based card game intervention by (Jiang et al., 2024) demonstrated benefits sustained up to three months, while group music therapy by (Salgado-Vasco et al., 2025) showed immediate and significant reductions in anxiety and stress. These interventions appear particularly valuable for addressing existential concerns and meaning-making processes integral to the cancer experience. Therapeutic mechanisms include enhanced emotional expression, increased self-awareness, stress reduction through creative engagement, and strengthened sense of identity and purpose during cancer treatment. Technology-enhanced interventions represent an emerging frontier with significant potential for scalability and accessibility. The groundbreaking study by (Akdogan et al., 2025) utilizing ChatGPT-based counseling showed that AI-assisted interventions can

achieve clinically meaningful anxiety reductions, with 88.5% of AI responses rated as appropriate. This approach holds promise for addressing resource limitations in psychosocial care, though careful monitoring of accuracy remains essential. Virtual reality interventions by (Gautama et al., 2023) and digital motivation programs by (Kisecik Sengul & Kilicarslan, 2025) further illustrate the flexibility of technology-based approaches in delivering accessible and standardized interventions across healthcare settings.

This review highlights important age-related patterns in intervention effectiveness. Pediatric populations consistently demonstrated faster response times and often larger effect sizes compared to adults. Children appeared to respond particularly well to creative, game-based, and technology-enhanced interventions, reflecting their developmental preferences for interactive and engaging therapeutic modalities. Adults showed sustained benefits from structured cognitive and mindfulness-based approaches aligned with their capacity for abstract thinking and longer attention spans. These developmental considerations suggest that

intervention selection should be guided not only by evidence of effectiveness but also by therapeutic mechanisms and delivery methods appropriate to the patient's age. Several key factors emerged as critical for successful implementation across intervention types. Duration and intensity of interventions showed varying optimal ranges, with children responding to shorter and more intensive formats lasting 7 days to 5 weeks, while adults benefited from longer-term approaches extending 8–12 weeks. Cultural adaptation proved essential, as demonstrated by the integration of prayer and cultural beliefs in the RADO intervention, indicating that therapeutic effectiveness is enhanced when interventions align with patients' existing belief systems and cultural practices. Therapist training and competence emerged as vital factors, particularly for complex interventions such as CBT and mindfulness-based approaches, highlighting that successful implementation depends heavily on provider preparation and ongoing supervision.

The included studies demonstrated several methodological strengths, including

the use of validated anxiety measures such as the Hamilton Rating Scale for Anxiety, Self-Rating Anxiety Scale, and PROMIS measures; randomized controlled designs that minimized selection bias; and diverse populations representing various cancer types and treatment stages. However, limitations included heterogeneity in intervention protocols making direct comparisons challenging, varying follow-up periods that limited understanding of long-term effectiveness, and limited economic evaluation data restricting cost-effectiveness assessments. Sample sizes varied considerably from 20 to 235 participants, potentially affecting statistical power to detect smaller yet clinically meaningful effects. The evidence supports implementation of multi-modal psychosocial care approaches in oncology settings, with clinicians considering patient age, cancer stage, cultural background, and individual preferences when selecting interventions. The effectiveness of technology-enhanced interventions suggests opportunities to address resource limitations and improve accessibility, which is particularly critical given the rising demand for psychosocial support in

cancer care. Healthcare systems should develop protocols for anxiety symptom screening, matching patients with appropriate interventions, and monitoring treatment response to optimize therapeutic outcomes.

Extended long-term follow-up studies beyond three months are needed to establish durability of intervention effects and identify factors associated with sustained benefits. Investigations into biomarkers, genetic factors, or psychological predictors may enable more personalized intervention selection and dosing. Economic evaluations comparing cost-effectiveness of different psychosocial interventions could support implementation decisions in resource-limited healthcare systems. Integration of artificial intelligence and digital health technologies represents a particularly promising avenue for future research, with potential to democratize access to psychosocial support while maintaining clinical effectiveness through rigorous evaluation of safety, accuracy, and long-term outcomes.

CONCLUSION(S)

This review demonstrates that psychosocial interventions—including cognitive-behavioral therapy, mindfulness, support groups, creative therapies, and digital technologies—are effective in reducing cancer-related anxiety in both pediatric and adult populations. Children respond more quickly to creative and technology-based approaches, while adults benefit from structured cognitive and mindfulness interventions. Emerging technologies such as VR, digital platforms, and AI hold strong promise for improving accessibility and scalability of psychosocial care in oncology.

Conflict of Interest

The authors declare no financial or personal conflicts of interest related to this study and its publication.

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