The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 3, 2025

ANXIETY DURING THE PERIOPERATIVE AND POSTOPERATIVE PHASES AND ITS MANAGEMENT IN GYNECOLOGICAL MALIGNANCIES: A THOROUGH EVALUATION OF CLINICAL EVIDENCE

Rifat Yasmeen[*1], Shaista Arshad[2], Shamim Akhtar[3], Iram Shahzadi[4], Mashal Zafar[5], Sadia Hanif[6]

[*1]*Akhtar Saeed College of Nursing, Lahore, Pakistan*
[2, 3]*Nursing Instructor Riphah College of Nursing, Rawalpindi*
[4]*Lecturer Riphah University Gulbergreen, Islamabad*
[5]*Trainee Medical Officer at Gynae and Obstetrics Department of Qazi Hussain Ahmad Medical Complex Nowshehra*
[6]*Senior Nursing Lecturer Akhtar Saeed College of Nursing Lahore*

[*1]riffat07@yahoo.com, [2]shaista.arshad@riphah.edu.pk, [3]shamim.akhtar@riphah.edu.pk, [4]iram.shahzadi1@riphah.edu.pk, [5]mashalzafar402@gmail.com, [6]hanif.sadia777@gmail.com

DOI: https://doi.org/10.5281/zenodo.15043443

Keywords
Uterine Cancer, Ovarian Cancer, Endometrial Cancer, Nursing Interventions, Quality of Life.

Article History
Received on 10 February 2025
Accepted on 10 March 2025
Published on 18 March 2025

Corresponding Author: *

Abstract

The primary treatment for gynecological cancers consists of surgical intervention because it delivers definite potential for cure among females. Modern research shows gynecological cancer patients experience a high risk of anxiety throughout perioperative and postoperative periods despite anxiety symptoms producing negative impacts on surgical recovery. Multiple treatment methods prove effective for decreasing anxiety both before and after gynecological cancer surgery. The author conducted an extensive review process to collect evidence surrounding this subject matter. An exhaustive database investigation yielded twenty-eight studies that met our requirements. The study shows that females with gynecological tumors of the uterine, cervical, ovarian and endometrial or vulvar types experience increased anxiety during surgical operations and post-treatment recovery periods. Various socioeconomic therapeutic approaches, such as emergency intervention nursing, multifaceted collaborative, ongoing nursing, cognitive nursing, broad cognitive nursing, nostalgia therapy, intellectual, behavioral managing stress, hospital-family incorporated continuing nursing, high-quality nursing care, relaxation-focused nursing programs, and relaxation/counselling interventions, when used alongside psychotropic medications, show potential for alleviating perioperative and postoperative anxiety. The research delivers extensive information regarding pre-operative and postoperative anxieties in gynecological oncology patient care. Research results show that gynecological malignancy patients need effective clinical caregivers to manage their perioperative and postoperative anxiety, thus underscoring the requirement for more research on appropriate therapeutic strategies.

INTRODUCTION

Gynecological cancers develop from female reproductive organs or genitals, and they represent around 14% of all cancers affecting women worldwide (Ray-Coquard et al., 2018). Because of

their young age, forty percent of females who develop gynecological malignancies remain child-bearing age. The five key forms of antenatal cancer consist of cervical oncology alongside ovarian oncology and uterine oncology and vaginal oncology, and vulvar oncology that, use the organ names. Every cancer type creates specific health problems for patients' quality of life (QOL) through its symptom effects. The return rate for ovarian cancer patients reaches approximately 85%, and the survival rate for five years after diagnosis amounts to only 30%. The aged population's growth will create a significant increase in gynecological cancer occurrence during the upcoming decades. The particular treatments for gynecological malignancies consist of surgical procedures, chemotherapy, and radiation treatment based on disease metastasis levels. Doctors can utilize computerized algorithm systems and decision support tools to help them pick suitable screening protocols, diagnostic actions, and post-treatment management for gynecological cancer patients. The understanding of these malignancies is improving along clinical, physiological, and pathological fronts, yet the unpredictable prognostic interactions of the malignancies persist (Tarin, 2012). The combination of gynecological cancer and its medical treatment causes physical and psychological changes that lead to adverse psychosocial and sexual effects on the patient's life quality. Gynecological malignancy cure requires surgical intervention because all other systemic treatment methods, such as chemotherapy, immunotherapy, and chemo immunotherapy, provide only temporary relief. Quality of life during survivorship becomes better when management practices minimize healthcare complications and boost survival rates. Results from studies show that patients diagnosed with gynecological cancer obtain significant benefits from minimally invasive surgical procedures implementing laparoscopic and robotic surgical approaches.

Studies demonstrate that hospital patients who have surgery develop anxiety and panic symptoms after getting admitted to the facility (Rychnovsky, 2007). Hospitalization and surgical procedures result in dangerous health complications through the simultaneous occurrence of physical alterations and mental responses ("Standards of Medical Care in Diabetes—2013," 2012). Oncologic surgery patients face the most challenging situation since their malignant condition already generates substantial emotional distress (Baijens et al., 2020). Research confirms that nervousness during surgical periods and afterward significantly harms patient recovery and may produce unfavorable postoperative results (Shaughnessy & Zechmeister, 2016). Studies show that gynecological cancer patient's show elevated anxiety combined with depression symptoms in more than 70% of cases when compared to healthy controls due to their disease concerns (Schmitz et al., 2010). Patients who experience higher levels of anxiety during perioperative and postoperative stages tend to require increased anesthesia while showing more postoperative pain symptoms and spending more extended periods in the hospital (Page et al., 2021). Throughout history, healthcare professionals have neglected psychological issues in their clinical work.

Controlling anxiety symptoms together with negative emotional responses remains essential for individuals who have received gynecological malignancy diagnoses to recover appropriately. Psychotherapeutic interventions prove successful in handling the mental health difficulties of women with gynecological cancer, thereby justifying enhanced psychosocial care during surgical recovery periods. Research now proves that designated therapy techniques can reduce anxiety in gynecological cancer patients before and after surgery (Speiser et al., 2018). The research thoroughly analyzes the anxiety levels experienced by patients with gynecological cancer from surgery throughout their postoperative recovery.

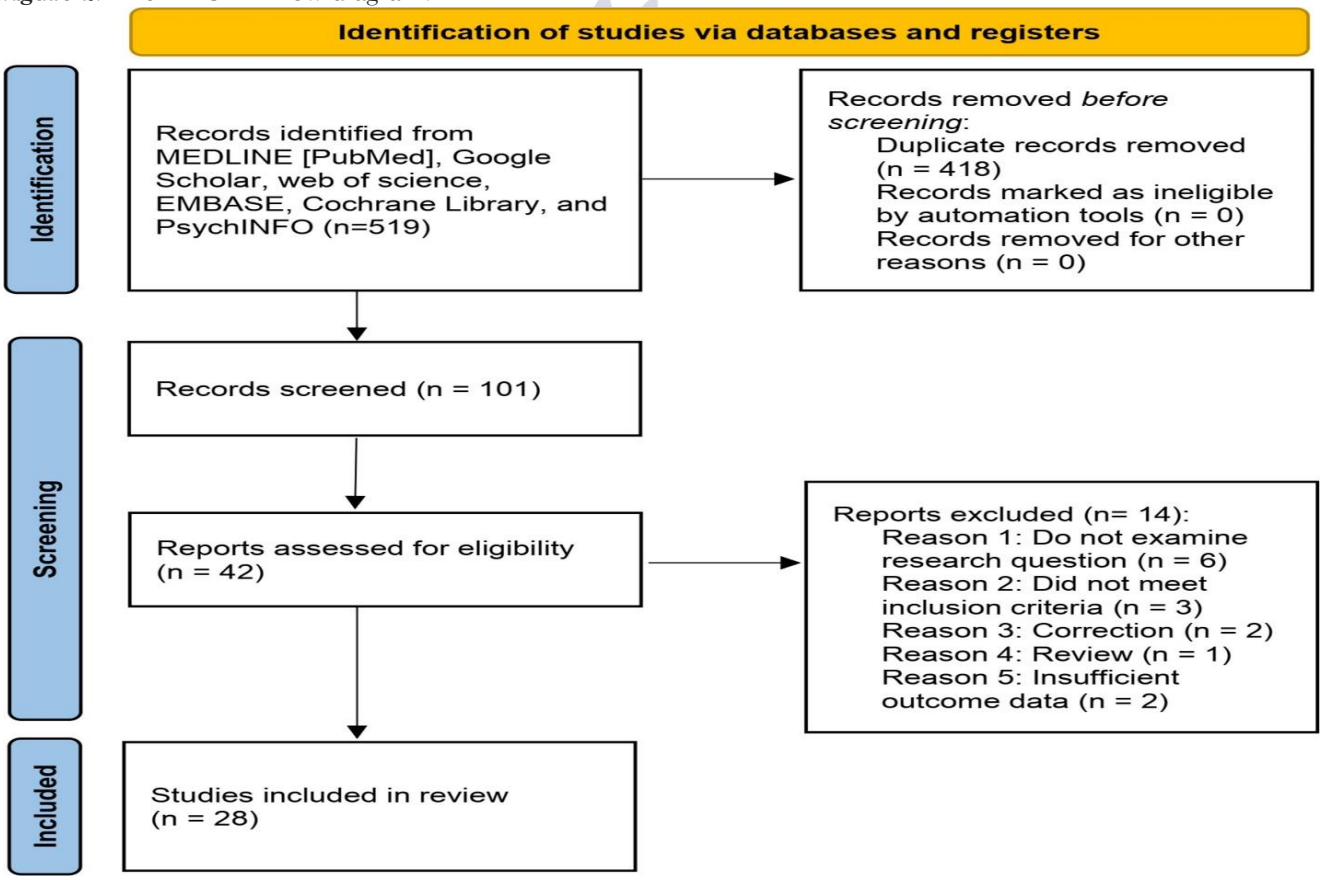
Literature review and characteristics of qualifying studies

The review utilized six electronic databases: Psych INFO and EMBASE, Google Scholar, Web of Science, and MEDLINE [PubMed]. The writers retrieved their web source research before January 1, 2024. The search terms included cancer of the ovaries combined with uterus and endometrium as well as cervical and vagina, and vulvar in MEDLINE-based database searches. Angst, Nervousness, Anxiousness, Super vigilance, Social or Social Anxieties, and Anxieties form the synonyms of Concern and Social Anxiety. Research teams

manually evaluated direct references between more acceptable research reports. Research of duplicate publications, reviews, letters, and comments from meetings and experimental trials were excluded from the selection. One researcher and a third author or the author from the first group separately performed the search before resolving any discrepancies.

The researchers utilized Figure 1 to display their selection process for gynecological cancer patients undergoing perioperative and postoperative anxiety problems using the PRISMA flow diagram. A total of 28 studies received validation because they met all requirements for inclusion, as per Dellinger et al. (2013). A standardized data table was developed to verify relevant data in all considered publications. The research analyzed forty publications across thirty years from 1993 until 2023, including studies from various national and geographical areas. Additionally, the research included geographical areas such as the USA, China, the UK, Italy, Sweden, Thailand, Australia, Japan, Canada, Turkey and Korea. 22–742 participants were involved in research papers examined during the study. The research methodology exclusively employed randomized controlled trials (RCTs), cohorts, case-control, cross-sectional, prospective, retrospective, and meta-analyses. The study compilation presented its results via Tables 1 and 2, showing fourteen reports about uterine cancer and six regarding ovarian cancer while featuring five endometrial cancer reports as well as unknown gynecologic malignancy reports, which included vulva and cervix cancers. The anxiety evaluation included quality of life measurements, TAI and HADS, GAD, IDAS, SAS, PROMIS, and HAMA tools, psychological well-being assessments, and Brief Profile of Mood States questionnaires. The vital results of these 28 approved studies are examined in this section.

Figure 1: The PRISMA flow diagram.



Uterine Cancer

Postoperative radiotherapy, chemo radiation, and chemotherapy

The rate of uterine cancer remains the top malignancy of the female reproductive system because obesity and overweight levels have been rising since the 1980s, according to research (Xie et al., 2015). The surgical treatment of uterine cancer now includes laparoscopic and robot-assisted hysterectomy because it provides improved minimally invasive procedures. People diagnosed with uterine cancer develop psychological challenges because of surgical complications which affect them throughout the perioperative and postoperative periods no matter what type of surgery they receive. Among the assessment data, fourteen research studies delivered information regarding anxiety in women undergoing surgery for uterine cancer. The literature presents a wide range of anxiety assessment findings for these patients, from 8.6% to 65%, as reported in Table 1.

Table 1: Interventions for perioperative and postoperative anxiety in uterine cancer patients.

Study/ Reference	Study design	Sample size	Cancer type/ intervention	Assessment for anxiety	Main findings
(Caffo et al., 2003)	Prospective study	25 patients	Treatment of uterine cancer with radiation after surgery	Diary card	The combination of uterine cancer major surgery treatment with pelvic radiation therapy leads to anxiety disorders as P<0.05 demonstrates increased prevalence in younger patients.
(Roberts & Naik, 2006)	RCT	40 patients	Perioperative self-catheterization, uterine malignancy, and extensive surgery	Quality of life questionnaire	Patients who underwent cervical cancer radical surgery preferred intermittent self-catheterization over suprapubic catheterization because this method reduced their anxiety while increasing their freedom and decreasing their embarrassment leading to normal lifestyle maintenance.
(Distefano et al., 2008)	Retrospective study	93 patients	Chemoradiation and extreme surgery for uterine cancer	HADS	The anxiety rates for patients with locally advanced cervical cancer undergoing preoperative chemoradiation were much higher (27.6% vs. 8.6%) than those for early stage patients undergoing radical surgery (p = 0.034).
(Kobayashi et al., 2009)	Prospective study	60 patients	Radiation, chemotherapy, and adjuvant radiation for uterine cancer	HADS	The tested treatment groups showed similar anxiety patterns throughout the experiment without any significant changes detected. Participants with high self-esteem demonstrated lower anxiety levels than those with low self-esteem as measured by P=0.008.
(Brotto et al., 2013)	Pilot study	34 patients	Cancer of the uterus with radiation treatment	BAI	Patients who underwent radical hysterectomy had a lower incidence of anxiety than radical trachelectomy patients after one month of surgery (RH: 7.29 vs RT: 7.75; P=0.005). At six months following surgery the anxiety levels reversed with RH patients scoring

					7.33 and RT patients scoring 2.55 (P=0.032).
(Wallin et al., 2019)	Prospective study	26 patients	Advanced uterine cancer treatment with robotic-assisted hysterectomy	The psychological wellbeing questions	A total of 17 out of 26 people (65%) experienced increased anxiety between their pre-surgical levels and their one-year post-surgical marks. The patients experienced a combination of labial numbness with dyspareunia and lymphedema together with urinary complications.
(Li et al., 2021)	Casecontrol study	151 patients	Crisis intervention nursing, drastic hysterectomy, and uterine cancer	HAMA	Patients undergoing laparoscopic radical hysterectomy undergoing crisis intervention nursing assessments through cognitive and psychological as well as behavioral and social assessments demonstrated significantly lower HAMA scores compared to patients receiving traditional nursing care.
(Han et al., 2021)	Casecontrol study	132 patients	Issues related to uterine cancer, surgical procedures, and nursing care	SAS	Participants enrolled in multidisciplinary collaborative continuous nursing services that included collaborative nursing plans showed decreased anxiety scores compared to patients receiving regular continuous nursing.
(Ma et al., 2021)	Casecontrol study	96 patients	Psychological nursing, vaginal lavage using traditional Chinese medicine, and surgery for uterine cancer.	SAS	The combination of traditional Chinese medicine vaginal lavage and psychological nursing care produced better results than traditional nursing by reducing anxiety levels in these patients. Integration of these techniques can potentially boost patient immune health and both T-lymphocyte subset counts along with bone marrow's capacity to produce blood cells.
(Shi et al., 2021)	Casecontrol study	109 patients	Postoperative psychosocial support for uterine cancer patients (ten days)	HADS	The submissive scores of hospital anxiety and depression scale-anxiety in cervical cancer patients adopting comprehensive psychological nursing support surpassed scores from patients using standard nursing methods ten days after their surgery. These patients under psychological nursing intervention benefited from improved negative emotions and social support and enhanced immune functions.
(Liu et al., 2021)	Casecontrol study	141 patients	Therapy for uterine cancer, chemotherapy after surgery, and mental health nursing (three	SAS	At 30, 60 and 90 days of intervention the patients who received psychological nursing and postoperative chemotherapy showed lower anxiety

			months)		levels than patients getting regular nursing care (all P < 0.05). The scores on the SAS scale demonstrated a negative relationship against the total points on the EROTC-Quality of Life Questionnaire-C30 (r = -0.4438, P < 0.05).
(Liu et al., 2022)	RCT	152 patients	Care for a period of twelve months was part of the uterine cancer surgery and memory treatment regimen.	HADS	The HADS-A scores of patients in the reminiscence therapy involved care (RTIC) intervention remained lower than scores from the usual care control group starting at 6 months post-intervention until month 12 (all P < 0.05). Evidence shows that RTIC therapy decreases depressive symptoms and improves life quality for cervical cancer postoperative patients (all P < 0.05).
(Yuan et al., 2023)	RCT	172 patients	Cognitive behavioral stress treatment for uterine cancer patients after surgery (8 weeks)	SAS	The provision of cognitive behavioral stress management led to reduced anxiety levels in cervical cancer patients since patients receiving this treatment experienced lower levels at 3 months (P=0.04) and 6 months (P=0.019) post-discharge in comparison to standard care alone. The treatment lowered depression symptoms while improving life quality among patients receiving cervical cancer diagnosis.
(Li et al., 2023)	Casecontrol study	114 patients	Integrating continuation nursing in a hospital-family environment, uterine cancer, and postoperative care.	The Brief Profile of Mood States	Hospital-family integrated continuation nursing proved better than traditional nursing care methods for managing anxiety because the patients in this group experienced lower anxiety scores (P = 0.017). Postoperative uterine cancer patients who underwent the nursing intervention showed reduced depression (P = 0.009) as well as fatigue ratings (P = 0.012) and anger levels (P < .001).

Local control benefits in uterine cancer patients are achieved regularly by using post-hysterectomy cervical or corpus radiation therapy (Cibula et al., 2023). Adjuvant radiation therapy generates acute side effects that severely worsen patient psychosomatic pain. People with emotional disturbances tend to experience poor therapy adaptation, which leads to decreased quality of life. Doctors need to identify the damaging mental effects which occur after receiving pelvic radiation treatments following surgery. Uterine cancer patients who received postoperative radiation therapy exhibited signs of anxiety in two evaluated studies. The research by Bocci and Francia (2014) included 25 female subjects with uterine cancer receiving postoperative radiation, which required diary card evaluations of their anxiety symptoms. Adjuvant pelvic radiation therapy with significant surgery for uterine cancer treatment showed evidence of anxiety disorders, yet participants maintained low anxiety throughout the treatment duration, according to scientific findings. Younger patients

between weeks two and five of therapy experienced higher rates of anxiety, as shown in subgroup results (P<0.05). Medical experts agree that cervical cancer patients in Ib2/IIb stages (less than 4 cm diameter) or IIIb/IV stage need combined chemotherapy as well as radiotherapy. Constant exposure to significant surgery followed by pelvic radiation therapy leads patients to report lower anxiety symptoms during treatment consistently. Prospective research conducted by Concin et al. (2021) assessed anxiety levels among patients receiving radiation therapy apart from chemo radiotherapy and postoperative radiotherapy. The study research did not detect any variation in anxiety between treatment groups during the observation period. The scores for anxiety assessments showed no substantial differences between patients with early-stage and advanced-stage cancers (P=0.866).

Patients who had higher self-esteem showed substantially reduced anxiety compared to those with lower self-esteem throughout every treatment group (all P<0.05). The results of this study demonstrated that treatment approaches and disease phases did not produce noteworthy changes in the expected anxiety experiences of uterine cancer patients. Extensive research has not been conducted throughout many years to establish the effects of chemoradiation therapy on cervical cancer survivor quality of life. Patients in the Nieder and Langendijk's (2016) study who received preoperative chemoradiation for locally advanced cervical cancer exhibited markedly stronger anxiety compared to patients in the early stage who underwent radical surgery (27.6% versus 8.6%, P=0.034). People diagnosed with locally advanced cervical cancer present higher scores in HADS-anxiety measurements because their susceptibility to anxiety is more significant than those diagnosed with early stages of the disease. The combination of chemotherapy agents leads to severe physical limitations and diminished self-perception in patients because of both intensive adverse effects and lengthy medication periods (Medicine et al., 2008). Postoperative treatment for cervical cancer patients resulted in extended anxiety symptoms based on N. a. O. S. E. A. Medicine et al. (2017) research findings. Postoperative radiotherapy combined with chemoradiation and chemotherapy treatment leads to higher susceptibility of cervical cancer patients to anxiety-induced adverse outcomes, according to the referenced study. Such patients could achieve therapeutic benefits by participating in psychological therapy approaches.

Nursing interventions

Numerous studies show how cancer patients receive better benefits when nurses deliver proper care during their surgical period and immediately before the operation (Kai et al., 2020). New healthcare practices developed from the expanding requirement for reducing anxiety in women with uterine cancer during both postoperative and perioperative periods. Medical evidence indicates that nurses can successfully help uterine cancer patients reduce anxiety during surgery and after surgical recovery. Patients undergoing laparoscopic radical hysterectomy with crisis intervention nursing experienced lower HAMA scores when nurses applied cognitive, psychological, behavioral, and social strategies rather than traditional nursing approaches, according to Misiołek et al. (2018). Research findings prove that Kriz intervention nursing acts effectively to decrease anxiety in patients with uterine cancer. The nurses employed multidisciplinary sustained care through which they provided direct sessions with patients combined with We Chat and telephone assistance (Wang et al., 2022). The team provided dietary counselling alongside pain management medicine while helping with psychological aspects of care, assisted patients with their self-care needs, and monitored social and daily life complications.

The treatments implemented by clinical nurses prove successful in handling anxiety among patients diagnosed with uterine cancer. The research by Holland demonstrated that patients getting comprehensive psychological nursing had better results on hospital anxiety and depression scale ratings than patients receiving traditional nursing procedures by day ten after cervical cancer surgery (2002). A psychological nursing approach to treating patients leads to improved negative emotions, better social support, and stronger immune responses. Health education, behavioral and emotional support, and social support interventions were the principal components that built the comprehensive cognitive

intervention framework. Patients who received postoperative chemotherapy with psychological nursing care experienced less anxiety at all follow-up time points 30, 60 and 90 days than those managed by conventional nursing care methods (all $P < 0.05$, Detterbeck et al. (2013)). The study data showed a negative correlation between SAS scores and EROTC-Quality of Life Questionnaire-C30 scores, as demonstrated by a $P < 0.05$ statistical validity ($r = -0.4438$). Psychological psychotherapy proved to be successful for chemotherapeutic anxiety reduction in patients during short-term as well as extended periods post-treatment. The study applied recollection therapy integrated care (RTIC) combined with education about self-introduction and health information regarding familial dynamics and local identity. School recollection therapy focuses on life memories from educational years, working experiences, and hobbies.

Yates et al. (2018) established that patients who received RTIC therapy showed decreased HADS-A scores than regular care recipients between months 6 to 12 after intervention (all $P < 0.05$). The data from this controlled study indicated that RTIC treatment decreased depression symptoms alongside enhancing the quality of life in cervical cancer patients following surgical procedures (all $P < 0.05$). Staff members taught pelvis-focused care to patients while leading them through the Cognitive Behavioural Stress Management (CBSM) program for stress management. Through the program, patients learned to detect automatic thoughts and cognitive errors, whereas the physiology of stress received instruction. The patients engaged in cognitive-behavioral evaluation procedures. They also learned relaxation skills as part of the program. The research by N. a. O. S. E. A. Medicine et al. (2017b) demonstrated that CBSM offered better anxiety relief to cervical cancer patients than standard treatment both at 3 months ($P=0.04$) as well as 6 months ($P=0.019$) after hospital release. People with cervical cancer reported better life quality alongside depression reduction through this therapeutic method.

This intervention enables nursing care to proceed throughout medical facility-to-home patient transfers, thus enabling the development of collaborative nursing continuity knowledge between hospital systems and families. Cancer researchers have presented this nursing intervention as a valid suggestion (Baxter & Jack, 2015). Results indicated that the hospital-family integrative continuation nursing group demonstrated lower anxiety levels in comparison to the usual nursing care group ($P= 0.017$) according to "Standards of Medical Care in Diabetes—2013" (2012b). Postoperative uterine cancer patients experienced decreased melancholy ($P= 0.009$), tiredness levels ($P= 0.012$), and hostility measured by ($P< 0.001$) through this nursing intervention (Lemoigne & Caner, 2009). Studies demonstrated that hospital-family integrated continuity of care delivered better treatment completion results to cervical cancer survivors compared to standard nursing treatments. The extended therapy improved both the patient's mood and familial relationships as well as sexual functioning. Studies demonstrate that Chinese medicine is effective in treating malignant tumors and cancer-related psychiatric conditions (Gustavsson et al., 2011). Studies have revealed that patients experienced decreased anxiety when using traditional Chinese medicine vaginal lavage alongside psychological nursing care ("Posters_Wednesday_14 October 2009," 2009). The combined medical approach improves immune function and T-lymphocyte numbers and supports bone marrow cell development. The research findings demonstrate that psychological nursing interventions effectively lower anxiety symptoms in patients, showing the vital importance of nursing care approaches for uterine cancer patients during their surgical period.

Additional targeted interventions

The technique of catheterization acts as an additional treatment during early uterine cancer management following radical hysterectomy (Bilbao et al., 2006). The effects of different catheterization techniques on anxiety levels in radical surgery patients with uterine cancer were studied through randomized controlled trial ("Diagnosis and Management of Ectopic Pregnancy," 2016). The authors noted that patients undergoing radical cervical cancer surgery chose intermittent self-catheterization because it reduced their anxiety along with their feelings of embarrassment and helped them maintain control over their regular life

activities. More women with early-stage cervical cancer who desire to keep their fertility choose radical trachelectomy because this procedure keeps their uterus intact (Chelmow et al., 2014). Research performed by Lara and Pascual (2023) demonstrated that the anxiety levels measured through BAI scores in radical hysterectomy (RH) patients were less than levels found in patients who received radiotherapy (RT) one month after their surgery (mean BAI score: 7.29 vs 7.75 P=0.005). After six months following the procedure the RH and RT groups demonstrated different BAI levels where RH had 7.33 points while RT had 2.55 points (P=0.032). This research showed radiotherapy enhanced emotional functioning and sexual activity with smaller incidence of sex-related distress than radical hysterectomy for the women under study. Radical Hysterectomy whether performed in open or laparoscopic fashion results in decreased sexual and bowel and bladder functions (Koh et al., 2013). The occurrence of anxiety has been linked to sexual as well as bladder and bowel dysfunction among women ("Standards of Medical Care in Diabetes—2013," 2012c). The study results from Alkatout and Biebl (2021) demonstrated that robot-assisted radical hysterectomy produced increased anxiety in 65% (17) of the 26 patients from their initial measurement to one-year follow-up. Numbness in the labia combined with sexual pain and lymphedema along with bladder disorders affected patients after their procedure. The analysis incorporates eight relevant studies which demonstrate different nursing methods used to reduce anxiety before and after surgery among people who have uterine cancer. The features of research studies discussed before appear in Table 1.

Ovarian Cancer

The medical community predicted that 22,240 new cases of ovarian cancer would happen in 2018 while 14,070 patients would die from the disease during that same period. Medical procedures stand as the most effective treatment option for ovarian cancer. During both the perioperative period and postoperative phase, ovarian cancer patients show high vulnerability to anxiety. The psychological condition of women with ovarian cancer leads to higher susceptibility to anxiety and other mental health problems (Izquierdo et al., 2021). Calcaterra et al. (2024) performed a retrospective research (sample size: 145) to show that symptom distress elevates the incidence of anxiety disorders in affected individuals. According to researchers, people with better health conditions consisting of younger age combined with higher education and early-stage sickness demonstrated the best quality of life; young women experience more health discomfort because their daily life tasks, such as caring for children and working, create challenges when trying to manage their health problems. A higher level of education enables these women to find and understand ovarian cancer information, which leads to better knowledge about their medical situation and available treatments, along with associated prognostic indications. The onset of cancer diagnosis in women leads to increased fear and anxiety that drives their mental health problems upward in incidence rates. Gaudio (2002) demonstrated preoperative patient development of anxiety similar to Green et al.'s findings, which negatively affected treatment outcomes. The leading causes of anxiety for patients were surgical trauma combined with chemotherapy treatment and discomfort alongside high treatment costs.

Table 2: Perioperative and postoperative anxiety and associated interventions in ovarian procedures

Study/ Reference	Study design	Sample size	Cancer type/ intervention or management	Assessment for anxiety	Main findings
(Schulman-Green et al., 2008)	Retrospective study	145 patients	Ovarian cancer/ postoperative	SAS	Symptom distress at a high level among patients leads to increased likelihood of developing anxiety disorders. The combination of younger age and higher education level among patients with early disease stage led to the lowest quality of life.
(Chittrakul et al.,	Cross-sectional	56 patients	Ovarian cancer/	HADS	The frequency of anxiety existed similarly

2015)	study		surgery		between people who had ovarian cancer and those who did not have cancer at 7.1%. The scores from the HADS questionnaire revealed no statistically significant variation between anxiety levels of cancer and non-cancer patients (5.0 vs 6.1, P=0.09).
(Jang et al., 2017)	RCT	22 patients	Ovarian cancer/surgery/ propranolol (40 mg two days before and 3 days after surgery)	STAI	The STAI scores remained similar between participants who took propranolol and those given placebo medications (P=0.79). Proper use of propranolol treatment before surgery proved effective in tumor load reduction.
(Jin et al., 2022)	Meta-analysis	742 patients	Ovarian cancer/perioperative period/high-quality nursing care	SAS	Patients with ovarian cancer who received high-quality nursing services demonstrated greater decreases in anxiety levels (P <.001) as well as depression levels (P <.001) during their perioperative period in comparison to those under standard nursing care.
(He et al., 2023)	Retrospective study	258 patients	Ovarian cancer/ perioperative period	SAS	The perioperative period brought widespread anxiety among patients as this emotional state directly affected their treatment progress. Anxiety developed from three causes: surgical trauma, chemotherapy exposure and treatment-associated pain and financial burden.
(Güler et al., 2023)	RCT	46 patients	Ovarian cancer/surgery/ relaxation-focused nursing program	STAI	Results demonstrated a better outcome from relaxation-focused nursing care than traditional approaches because patients experienced reduced anxiety scores to statistically significant levels (P <.001).

Research demonstrates that nursing intervention programs decrease anxiety disorders among ovarian cancer patients as they do when treating preoperative anxiety in patients with uterine cancer. Prior to ovarian cancer surgery, Nouri (2012) launched a nursing program which focused on patient relaxation. The nursing approach included patient contact and emotion-stimulated expression while developing a supportive environment to share anxiety-reducing information before performing relaxation methods and helping patients achieve peacefulness. The research showed that anxiety decreased significantly in patients receiving relaxation-oriented nursing care over traditional nursing practices (P < 0.001). High-quality nursing care provided to ovarian cancer patients during their perioperative period resulted in substantially decreased anxiety (MD= −9.00, 95%CI: -11.36 to -6.63, P <.001) combined with decreased depression (MD= −7.62, 95%CI: −8.45 to −6.78, P<.001) compared to patients who received standard nursing care as reported in a comprehensive meta-analysis by Wac (2012). The main components of high-quality nursing care include psychological counselling and patient guidance services. Research trials successfully established how nursing treatments reduce anxiety disorders among ovarian cancer patients throughout their operative period.

Surgery performed due to cancer causes substantial stress to patients. Beta-blocker propranolol stops beta-adrenergic receptors from activating, and research has confirmed that it effectively blocks all surgical stress effects on cancer development. Johnson et al. (2021) analyzed the effectiveness of administering propranolol to ovarian cancer patients during their surgery to evaluate its

capability to reduce surgical stress-induced epithelial cancer development. This investigation showed that propranolol treatment did not produce superior changes in STAI compared to the placebo group (-6.1 vs -5.0, P=0.79). The research showed that propranolol treatment during surgery successfully reduced tumor size even though anxiety measurements did not show significant changes. The study performed by Chittrakul et al. (2015) found that both ovarian cancer patients and those without cancer showed the same level of anxiety at 7.1%. The HADS anxiety scale demonstrated similar rating results between cancer and non-cancer patients (5.0 for cancer patients and 6.1 for non-cancer patients with a P value of 0.09). Literature shows that the initial evaluation of the quality of life, together with performance status, serves as predictive indicators for progression-free survival (PFS) and overall survival (OS) among patients with advanced ovarian cancer (D'Souza et al., 2022). The treatment of advanced epithelial ovarian cancer through aggressive neoadjuvant chemotherapy becomes necessary when patients have poor performance status (Ledermann et al., 2013). A diminished performance status occurs in advanced ovarian cancer patients due to peritoneal or pleural carcinomatosis, thus increasing perioperative anxiety, specifically among women who have received gynecological malignancy treatment. Evidence shows that experts maintain different viewpoints about the development of anxiety throughout ovarian cancer perioperative and postoperative periods (Table 2), which demands additional relevant studies to examine these scientific challenges.

Endometrial Cancer

The prevalence of endometrial cancer shows an ongoing upward trend, which differs from various other cancer types (Wise et al., 2014). Endometrial cancer patients have an 84% chance of surviving for five years, according to relative survival rates, which points to a favorable clinical outcome. The surgical procedures for endometrial cancer result in anxiety symptoms which affect patients. Davidson et al. (2018) revealed that endometrial cancer patients (N=132) showed a 19.5% anxiety disorder (score ≥11) incidence following surgical treatment, which dropped to 12.3% at 3 months and reached 6.2% at 24 months post-surgery. This previous investigation discovered that patients suffered their worst pain episodes when their stress levels increased (Baumeister et al., 2001). The research demonstrated that anxiety stands as a crucial factor which increases the risk of postoperative pain. Rao (2008) analyzed 714 patient cases using retrospective methods where endometrial cancer women showed a postoperative anxiety occurrence of 15.55%. The study findings established that postoperative pain and concomitant liver illness function as independent risk factors which increase the chances of anxiety disorders in postoperative patients. Robotic surgery stands as the minimal invasively performed treatment for endometrial cancer patients. Endometrial cancer patients showed a 27% (17/64) rate of anxiety before robotic surgery, yet their concern rates fell to 7% (4/64) two weeks after surgery, according to Aitchison et al. (2024). Depression symptoms among surgical patients showed no change in prevalence rates from the preoperative to postoperative stages (P= 0.58) despite reductions in preoperative anxiety symptoms. Anxiety problems frequently develop in women who have undergone endometrial cancer procedures; hence, psychotropic medication could function as an essential treatment method for anxiety issues. Sanjida et al. found that endometrial cancer patients experienced anxiety at a rate of 2.5% based on analysis of (18/719) individuals. The prescription of psychiatric drugs to women after surgery remained very low, as 16.8% required at least one psychiatric drug (n = 121/719). Out of all prescriptions issued, antidepressants occupied 12.6%, and anxiolytics claimed 2.1%, whereas an additional 1.6% consisted of anxiolytic prescriptions.

Table 3: Perioperative and postoperative anxiety and associated interventions in endometrial procedures

Study/ Reference	Study design	Sample size	Cancer type/ intervention or management	Assessment for anxiety	Main findings
(Ferrandina et	Prospective study	132 patients	Endometrial	HADS	Among endometrial cancer patients

al., 2014)			cancer/surgery		undergoing surgery the prevalence of anxiety disorders exceeded 11 (score ≥11) and amounted to 19.5%. At three months post-surgery the studied population showed decreased anxiety prevalence rates to 12.3% before settling at 6.2% during the second year of follow-up.
(Honerlaw et al., 2016)	Casecontrol study	71 patients	Endometrial cancer/recoveri ng from surgery	IDAS	During moments when patients felt increased anxiety the pain intensity reached its highest point. High levels of anxiety function as a vital risk factor that increases postoperative pain experiences.
(Sanjida et al. 2019)	RCT	719 patients	Endometrial cancer/surgery / psychotropic medications	NA	Among endometrial cancer patients the incidence of anxiety reached 2.5% because 18 out of 719 people experienced these symptoms. The surgeons prescribed psychotropic medicines to only a few women after their surgical procedures.
(Wang et al., 2020)	Retrospective study	714 patients	Endometrial cancer/ undergoing surgery	HAMA	The research showed postoperative anxiety occurred in 15.55% of endometrial cancer patients. Recent research determined that postoperative pain (OR=3.166, P<0.001) together with combined liver disease (OR=2.318, P=0.001) serve as distinct risk factors that lead to anxiety disorders in postoperative patients.
(Lindfors et al., 2023)	Prospective study	64 patients	Endometrial cancer/ robotic surgery	GAD-7	A total of 27% (17/64) of endometrial cancer patients experienced anxiety before surgery eventually decreased to 7% (4/64) two weeks following robotic surgery (P=0.012). Information from the study indicates that participants showed decreased anxiety symptoms after their surgery but their depression rate stayed constant over the one-year observation time (P= 0.58).

The research data established that endometrial cancer patients received more medications than average citizens, yet their drug utilization equaled that of patients with different forms of cancer. Global increases in women's life expectancy create concerns about age-related diseases, including hypertension together with diabetes mellitus, obesity, and cardiovascular disease, because they have the potential to delay cancer therapy success and affect the disease outcome for patients with gynecological cancers. The research conducted by Sugarbaker (2012) utilized the age-adjusted Charlson comorbidity index score (A-CCI) to measure the survival effects of multiple comorbidities and medication treatments in patients with endometrial cancer. Patients who score 3 points or higher on the A-CCI experience intensified tumor aggressiveness, higher recurrence rates, and increased death risk

from their illness. The study revealed how endometrial cancer patients face considerable health problems that create strong links to their survival rates. Patient survival will be affected by both the presence of comorbidities and patient age and drug use at the same time. The research indicated that endometrial cancer patients with A-CCI scores equal to or exceeding three will likely develop perioperative or postoperative anxiety. The benefits of early therapeutic practices become evident when treating patients. Research studies regarding perioperative and postoperative anxiety in endometrial cancer patients are presented in Table 3.

Additional gynecological and gynecological malignancies

Different research studies demonstrated the presence of anxiety problems in females experiencing gynecologic cancer surgery and various gynecologic cancer treatments prior to and after their surgeries. A study of 138 cervical and vulva cancer patients revealed that postoperative sexual complications exist strongly alongside patient anxiety, according to data from Watrowski & Sparic (2022). Patients diagnosed with gynecological cancer showed twice as much probability of anxiety (95%CI: 1.2-5.0) following their surgical procedures, according to the research conducted by Smith et al. in 2006 involving 281 prioritized participants. The surgical difficulties led to the need for continuing anxiety treatment.

Table 4: Perioperative and postoperative anxiety and associated interventions in other gynecological cancers

Study/ Reference	Study design	Sample size	Cancer type/ intervention or management	Assessment for anxiety	Main findings
(Corney et al., 1992)	Retrospective study	138 patients	Cervix and vulva cancers/surgery	HADS	Patients who experienced elevated anxiety levels showed significant relationships between their surgical sex-related problems.
(Petersen et al., 2002)	RCT	50 patients	Gynaecological cancer/postoperative period/relaxation and counselling intervention (6 months)	HADS	Those patients who received relaxation counseling ended up with notably reduced anxiety scores according to P<0.02 results. Body scan, conscious breathing, progressive muscle relaxation and guided imagery made up the relaxation exercise.
(Doll et al., 2016)	Prospective study	281 patients	Gynecologic and gynecologic cancers/undergoing surgery	PROMIS	The research results showed that postoperative patients demonstrated a substantially elevated likelihood of anxiety at month one after surgery versus their baseline anxiety level (OR=2.5, 95% CI: 1.2–5.0). Anxiety developed through temporary surgical complications which continued to affect patients.

The Australian research by Aasmul et al. (2018) used an RCT approach to show that patients who received relaxation counselling exhibited better results for anxiety subscale measurements (P<0.02). Patients learned four elements during the exercise: conscious breathing, body scanning, progressive muscle relaxation, and guided imagery practice. The intervention led to patients' immediate symptom improvement, an attractive measurement outcome. A literature analysis shows that anxiety rates are higher than other psychological issues for gynecological cancer patients undergoing surgery.

According to Table 4, nurses should assist with symptom relief for anxiety and strive to enhance the quality of patient life. Current research on postoperative gynecological cancer patient anxiety relief through nursing interventions comes from multiple minimal studies. Proof regarding nursing interventions requires additional confirmation through increased large-sample Randomized Controlled Trials.

Additional probable causes related to anxiety in individuals with gynecological malignancies

Patients who receive gynecological cancer treatments develop perioperative anxiety states, which result from different variables that affect preoperative, intraoperative and postoperative periods. Multiple important factors must be evaluated before surgical interventions are performed for gynecological cancer patients. These factors include the specific surgical procedure, the type of cancer, the surgical modality, the level of risk involved, the amount of time spent preparing for surgery, the length of the procedure, the patient's personality, their emotional state, their social support, their health status, their level of education, their preoperative knowledge, their psychological components, their self-perception, their mental health, and their coping mechanisms, and finally, financial considerations such as medical expenses, insurance coverage, and financial worries. The presence of anxiety in patients implements adverse effects on psychological treatment outcomes through these influencing variables.

Prevention of gynecologic cancers

Preventive strategies against gynecologic malignancies offer a practical approach to decreasing cancer incidence, which automatically reduces patient anxiety during perioperative and postoperative stages. An extensive review of gynecological malignancy prevention methods was published by Ferrari and colleagues (I. O. Medicine et al., 2010). Studies show that endometrial carcinoma risk decreases when patients maintain a lower body mass index alongside weight loss in obese women and use oral contraceptives for prolonged periods. When patients combine barrier contraceptive devices with HPV vaccines and smoking avoidance, their chances of getting HPV infections decrease, which leads to reduced cervical carcinoma development. Scientists believe yearly testing using CA 125 alongside HE4 proteins could help detect ovarian cancers effectively. These preventive and diagnostic methods serve two functions: to stop gynecologic malignancies in their early stages or to detect them early so that appropriate treatment can start at the right time. The chosen approach works by reducing both perioperative and postoperative anxiety of patients indirectly.

Implications for clinical practice

Patients diagnosed with vulval, endometrial, uterine, cervical or ovarian tumor conditions show a strong tendency toward anxiety symptoms covering their entire operating and recovery period. The research contributes to scientific knowledge, demonstrating specific nursing practices for decreasing patient perioperative anxiety. Nurses employ many intervention approaches, including crisis intervention nursing, broad cognitive nursing, nostalgia therapy, intellectual personality stress control, hospital-family incorporated extension nursing, high-quality nursing care, relaxation-focused nursing programs, psychotropic medication, and relaxation/counselling interventions.

Limitations of the study

Multiple vital factors need evaluation to understand the research findings reported in the included studies. The research results are limited by several factors, such as small sample populations, non-uniform intervention approaches, varying anxiety measurement techniques, and patient-related confounding variables, encompassing age groups, tumor types, health conditions, research methodologies and economic variables. A multicenter randomized controlled study must conduct meticulous planning for standardized nursing treatments that address anxiety in patients with gynecological malignancies while using a sizeable study population.

Conclusion

The research marks the initial evaluation of anxiety symptoms specific to gynecological oncology perioperative and postoperative stages. Medical

procedures stand as the most effective treatment option for ovarian cancer. During both the perioperative period and postoperative phase, ovarian cancer patients show high vulnerability to anxiety. The psychological condition of women with ovarian cancer leads to higher susceptibility to anxiety and other mental health problems. A higher level of education enables these women to find and understand ovarian cancer information, which leads to better knowledge about their medical situation and available treatments, along with associated prognostic indications. Anxiety problems frequently develop in women who have undergone endometrial cancer procedures; hence, psychotropic medication could function as an essential treatment method for anxiety issues. Patients with gynecological malignancies experience substantial perioperative and postoperative anxiety at clinical levels, which requires investigation in intervention trials for treatment. Evidence shows that experts maintain different viewpoints about the development of anxiety throughout ovarian cancer perioperative and postoperative periods. Research demonstrates that nursing intervention programs decrease anxiety disorders among ovarian cancer patients as they do when treating preoperative anxiety in patients with uterine cancer.

REFERENCES

Aasmul, I., Husebo, B. S., Sampson, E. L., & Flo, E. (2018). Advance care planning in nursing homes – Improving the communication among patient, family, and staff: results from a cluster randomized controlled trial (COSMOS). *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.02284

Aitchison, K., Harwood, S., Bailey, S., Safdar, T., Reilly, R., Ashe, M., Bhawnani, A., Keogh, T., Shankar, S., Battye, E., Hartley, R., Densham, I., Matthews, G., Beckford, E., Noah, A., Matthews, E., Billings, J., & Dixson, T. (2024). Abstracts of the Winter Scientific Meeting 2024, 11-12 January 2024, QEII Centre, Westminster, London. *Anaesthesia*, *79*(S1), 7–88. https://doi.org/10.1111/anae.16193

Alkatout, I., & Biebl, M. (2021). *Recent advances in minimally invasive surgery*. Mdpi AG.

Baijens, L. W. J., Walshe, M., Aaltonen, L., Arens, C., Cordier, R., Cras, P., Crevier-Buchman, L., Curtis, C., Golusinski, W., Govender, R., Eriksen, J. G., Hansen, K., Heathcote, K., Hess, M. M., Hosal, S., Klussmann, J. P., Leemans, C. R., MacCarthy, D., Manduchi, B., . . . Clavé, P. (2020). European white paper: oropharyngeal dysphagia in head and neck cancer. *European Archives of Oto-Rhino-Laryngology*, *278*(2), 577–616. https://doi.org/10.1007/s00405-020-06507-5

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is Stronger than Good. *Review of General Psychology*, *5*(4), 323–370. https://doi.org/10.1037/1089-2680.5.4.323

Baxter, P., & Jack, S. (2015). Qualitative case study Methodology: study design and implementation for novice researchers. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2008.1573

Bilbao, J., Martínez-Cuesta, A., Urtasun, F., & Cosín, O. (2006). Complications of embolization. *Seminars in Interventional Radiology*, *23*(2), 126–142. https://doi.org/10.1055/s-2006-941443

Bocci, G., & Francia, G. (2014). *Metronomic chemotherapy: Pharmacology and Clinical Applications*. Springer.

Brotto, L. A., Smith, K. B., Breckon, E., & Plante, M. (2013). Pilot study of Radical Hysterectomy versus Radical Trachelectomy on Sexual Distress. *Journal of Sex & Marital Therapy*, *39*(6), 510–525. https://doi.org/10.1080/0092623x.2012.667054

Caffo, O., Amichetti, M., Mussari, S., Romano, M., Maluta, S., Tomio, L., & Galligioni, E. (2003). Physical side effects and quality of life during postoperative radiotherapy for uterine cancer. Prospective evaluation by a diary card. *Gynecologic Oncology*, *88*(3), 270–276. https://doi.org/10.1016/s0090-8258(03)00076-3

Calcaterra, V., Rossi, V., Magenes, V. C., Baldassarre, P., Grazi, R., Loiodice, M., Fabiano, V., & Zuccotti, G. (2024). Dietary habits,

depression and obesity: an intricate relationship to explore in pediatric preventive strategies. *Frontiers in Pediatrics*, *12*. https://doi.org/10.3389/fped.2024.1368283

Cardiovascular Disease and Diabetes: Policies for Better health and Quality of care. (2015). In *OECD health policy studies*. https://doi.org/10.1787/9789264233010-en

Chelmow, D., Isaacs, C. R., & Carroll, A. (2014). *Acute care and emergency gynecology: A Case-Based Approach*. Cambridge University Press.

Cibula, D., Raspollini, M. R., Planchamp, F., Centeno, C., Chargari, C., Felix, A., Fischerová, D., Jahnn-Kuch, D., Joly, F., Kohler, C., Lax, S., Lorusso, D., Mahantshetty, U., Mathevet, P., Naik, R., Nout, R. A., Oaknin, A., Peccatori, F., Persson, J., . . . Lindegaard, J. (2023). ESGO/ESTRO/ESP Guidelines for the management of patients with cervical cancer – Update 2023*. *Virchows Archiv*, *482*(6), 935–966. https://doi.org/10.1007/s00428-023-03552-3

Concin, N., Matias-Guiu, X., Vergote, I., Cibula, D., Mirza, M. R., Marnitz, S., Ledermann, J., Bosse, T., Chargari, C., Fagotti, A., Fotopoulou, C., Martin, A. G., Lax, S., Lorusso, D., Marth, C., Morice, P., Nout, R. A., O'Donnell, D., Querleu, D., . . . Creutzberg, C. L. (2021). ESGO/ESTRO/ESP guidelines for the management of patients with endometrial carcinoma. *Radiotherapy and Oncology*, *154*, 327–353. https://doi.org/10.1016/j.radonc.2020.11.018

Davidson, B., Firat, P., & Michael, C. W. (2018). *Serous effusions: Etiology, Diagnosis, Prognosis and Therapy*. Springer.

Dellinger, R. P., Levy, M. M., Rhodes, A., Annane, D., Gerlach, H., Opal, S. M., Sevransky, J. E., Sprung, C. L., Douglas, I. S., Jaeschke, R., Osborn, T. M., Nunnally, M. E., Townsend, S. R., Reinhart, K., Kleinpell, R. M., Angus, D. C., Deutschman, C. S., Machado, F. R., Rubenfeld, G. D., . . . Moreno, R. (2013). Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012. *Intensive Care Medicine*, *39*(2), 165–228. https://doi.org/10.1007/s00134-012-2769-8

Detterbeck, F. C., Lewis, S. Z., Diekemper, R., Addrizzo-Harris, D., & Alberts, W. M. (2013). Executive Summary. *CHEST Journal*, *143*(5), 7S-37S. https://doi.org/10.1378/chest.12-2377

Diagnosis and management of ectopic pregnancy. (2016). *BJOG an International Journal of Obstetrics & Gynaecology*, *123*(13). https://doi.org/10.1111/1471-0528.14189

Distefano, M., Riccardi, S., Capelli, G., Costantini, B., Petrillo, M., Ricci, C., Scambia, G., & Ferrandina, G. (2008). Quality of life and psychological distress in locally advanced cervical cancer patients administered pre-operative chemoradiotherapy. *Gynecologic Oncology*, *111*(1), 144–150. https://doi.org/10.1016/j.ygyno.2008.06.034

D'Souza, A., Shah, N., Rodriguez, C., Voorhees, P. M., Weisel, K., Bueno, O. F., Pothacamury, R. K., Freise, K. J., Yue, S., Ross, J. A., Polepally, A. R., Talati, C., Lee, S., Jin, Z., Buelow, B., Vij, R., & Kumar, S. (2022). A Phase I First-in-Human study of ABBV-383, A B-Cell maturation antigen × CD3 bispecific T-Cell redirecting antibody, in patients with Relapsed/Refractory Multiple myeloma. *Journal of Clinical Oncology*, *40*(31), 3576–3586. https://doi.org/10.1200/jco.22.01504

Gaudio, P. A. (2002). Histopathology of birdshot retinochoroidopathy. *British Journal of Ophthalmology*, *86*(12), 1439–1441. https://doi.org/10.1136/bjo.86.12.1439

Gustavsson, A., Svensson, M., Jacobi, F., Allgulander, C., Alonso, J., Beghi, E., Dodel, R., Ekman, M., Faravelli, C., Fratiglioni, L., Gannon, B., Jones, D. H., Jennum, P., Jordanova, A., Jönsson, L., Karampampa, K., Knapp, M., Kobelt, G., Kurth, T., . . . Olesen, J. (2011). Cost of disorders of the brain in Europe 2010. *European Neuropsychopharmacology*, *21*(10), 718–779. https://doi.org/10.1016/j.euroneuro.2011.08.008

Holland, J. C. (2002). History of Psycho-Oncology: Overcoming attitudinal and Conceptual Barriers. *Psychosomatic Medicine*, *64*(2), 206–221. https://doi.org/10.1097/00006842-200203000-00004

Izquierdo, M., Merchant, R., Morley, J., Anker, S., Aprahamian, I., Arai, H., Aubertin-Leheudre, M., Bernabei, R., Cadore, E., Cesari, M., Chen, L., De Souto Barreto, P., Duque, G., Ferrucci, L., Fielding, R., García-Hermoso, A., Gutiérrez-Robledo, L., Harridge, S., Kirk, B., . . . Singh, M. F. (2021). International Exercise Recommendations in Older Adults (ICFSR): Expert Consensus guidelines. *The Journal of Nutrition Health & Aging*, *25*(7), 824–853. https://doi.org/10.1007/s12603-021-1665-8

Johnson, R. A., Snyder, L. B. C., & Schroeder, C. (2021). *Canine and feline anesthesia and Co-Existing disease*. John Wiley & Sons.

Kai, M., Homma, T., Lochard, J., Schneider, T., Lecomte, J., Nisbet, A., Shinkarev, S., Averin, V., & Lazo, T. (2020). ICRP Publication 146: Radiological Protection of People and the Environment in the event of a large nuclear accident. *Annals of the ICRP*, *49*(4), 11–135. https://doi.org/10.1177/0146453209526559

Kobayashi, M., Ohno, T., Noguchi, W., Matsuda, A., Matsushima, E., Kato, S., & Tsujii, H. (2009). Psychological distress and quality of life in cervical cancer survivors after radiotherapy. *International Journal of Gynecological Cancer*, *19*(7), 1264–1268. https://doi.org/10.1111/igc.0b013e3181a3e124

Koh, W., Greer, B. E., Abu-Rustum, N. R., Apte, S. M., Campos, S. M., Chan, J., Cho, K. R., Cohn, D., Crispens, M. A., DuPont, N., Eifel, P. J., Gaffney, D. K., Giuntoli, R. L., Han, E., Huh, W. K., Lurain, J. R., Martin, L., Morgan, M. A., Mutch, D., . . . Hughes, M. (2013). Cervical cancer. *Journal of the National Comprehensive Cancer Network*, *11*(3), 320–343. https://doi.org/10.6004/jnccn.2013.0043

Lara, M. S., & Pascual, R. J. S. (2023). Self-reported sexual response in transgender women to audiovisual stimulation protocol. *Acta De Investigación Psicológica*, *13*(1), 29–41. https://doi.org/10.22201/fpsi.20074719e.2023.1.473

Ledermann, J., Raja, F., Fotopoulou, C., Gonzalez-Martin, A., Colombo, N., & Sessa, C. (2013). Newly diagnosed and relapsed epithelial ovarian carcinoma: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Annals of Oncology*, *24*, vi24–vi32. https://doi.org/10.1093/annonc/mdt333

Lemoigne, Y., & Caner, A. (2009). *Radiotherapy and brachytherapy*. Springer.

Medicine, I. O., Practice, B. O. P. H. a. P. H., & Research, C. O. W. H. (2010). *Women's health research: Progress, Pitfalls, and Promise*. National Academies Press.

Medicine, I. O., Services, B. O. H. C., & Setting, C. O. P. S. T. C. P. I. a. C. (2008). *Cancer care for the whole patient: Meeting Psychosocial Health Needs*. National Academies Press.

Medicine, N. a. O. S. E. A., Division, H. a. M., Policy, B. O. H. S., & Abuse, C. O. P. M. a. R. S. T. a. P. O. (2017a). *Pain management and the opioid epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use*. National Academies Press.

Medicine, N. a. O. S. E. A., Division, H. a. M., Policy, B. O. H. S., & Abuse, C. O. P. M. a. R. S. T. a. P. O. (2017b). *Pain management and the opioid epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use*. National Academies Press.

Misiołek, H., Zajączkowska, R., Daszkiewicz, A., Woroń, J., Dobrogowski, J., Wordliczek, J., & Owczuk, R. (2018). Postępowanie w bólu pooperacyjnym 2018 — stanowisko Sekcji Znieczulenia Regionalnego i Terapii Bólu Polskiego Towarzystwa Anestezjologii i Intensywnej Terapii, Polskiego Towarzystwa Znieczulenia Regionalnego i Leczenia Bólu, Polskiego Towarzystwa Badania Bólu oraz Konsultanta Krajowego w dziedzinie anestezjologii i intensywnej terapii. *Anaesthesiology Intensive Therapy*, *50*(3), 173–199. https://doi.org/10.5603/ait.2018.0026

Nieder, C., & Langendijk, J. (2016). *Re-Irradiation: new frontiers*. Springer.

Nouri, K. (2012). *MOHs Micrographic Surgery*. Springer Science & Business Media.

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*, n160. https://doi.org/10.1136/bmj.n160

Posters_Wednesday_14 October 2009. (2009). *Intensive Care Medicine*, *35*(S1). https://doi.org/10.1007/s00134-009-1599-9

Rao, K. S. K. (2008). *Perception of the elderly*. Global Vision Pub House.

Ray-Coquard, I., Morice, P., Lorusso, D., Prat, J., Oaknin, A., Pautier, P., & Colombo, N. (2018). Non-epithelial ovarian cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Annals of Oncology*, *29*, iv1–iv18. https://doi.org/10.1093/annonc/mdy001

Roberts, K., & Naik, R. (2006). Catheterization options following radical surgery for cervical cancer. *British Journal of Nursing*, *15*(19), 1038–1044. https://doi.org/10.12968/bjon.2006.15.19.22103

Rychnovsky, J. D. (2007). Postpartum fatigue in the Active-Duty military woman. *JOGN Nursing*, *36*(1), 38–46. https://doi.org/10.1111/j.1552-6909.2006.00112.x

Schmitz, K. H., Courneya, K. S., Matthews, C., Demark-Wahnefried, W., Galvão, D. A., Pinto, B. M., Irwin, M. L., Wolin, K. Y., Segal, R. J., Lucia, A., Schneider, C. M., Von Gruenigen, V. E., & Schwartz, A. L. (2010). American College of Sports Medicine Roundtable on Exercise Guidelines for Cancer Survivors. *Medicine & Science in Sports & Exercise*, *42*(7), 1409–1426. https://doi.org/10.1249/mss.0b013e3181e0c112

Shaughnessy, J. J., & Zechmeister, E. B. (2016). *Research methods in Psychology*. https://doi.org/10.24926/8668.2201

Smith, T. J., Khatcheressian, J., Lyman, G. H., Ozer, H., Armitage, J. O., Balducci, L., Bennett, C. L., Cantor, S. B., Crawford, J., Cross, S. J., Demetri, G., Desch, C. E., Pizzo, P. A., Schiffer, C. A., Schwartzberg, L., Somerfield, M. R., Somlo, G., Wade, J. C., Wade, J. L., . . . Wolff, A. C. (2006). 2006 Update of Recommendations for the Use of White Blood Cell Growth Factors: An Evidence-Based Clinical Practice Guideline. *Journal of Clinical Oncology*, *24*(19), 3187–3205. https://doi.org/10.1200/jco.2006.06.4451

Speiser, P. W., Arlt, W., Auchus, R. J., Baskin, L. S., Conway, G. S., Merke, D. P., Meyer-Bahlburg, H. F. L., Miller, W. L., Murad, M. H., Oberfield, S. E., & White, P. C. (2018). Congenital adrenal hyperplasia due to steroid 21-Hydroxylase deficiency: An Endocrine Society* Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*, *103*(11), 4043–4088. https://doi.org/10.1210/jc.2018-01865

Standards of Medical Care in Diabetes—2013. (2012a). *Diabetes Care*, *36*(Supplement_1), S11–S66. https://doi.org/10.2337/dc13-s011

Standards of Medical Care in Diabetes—2013. (2012b). *Diabetes Care*, *36*(Supplement_1), S11–S66. https://doi.org/10.2337/dc13-s011

Standards of Medical Care in Diabetes—2013. (2012c). *Diabetes Care*, *36*(Supplement_1), S11–S66. https://doi.org/10.2337/dc13-s011

Sugarbaker, P. H. (2012). *Peritoneal carcinomatosis: Principles of Management*. Springer Science & Business Media.

Tarin, D. (2012). Clinical and biological implications of the tumor microenvironment. *Cancer Microenvironment*, *5*(2), 95–112. https://doi.org/10.1007/s12307-012-0099-6

Wac, K. (2012). Smartphone as a personal, Pervasive Health Informatics Services Platform: Literature review. *Yearbook of Medical*

Informatics, *21*(01), 83–93. https://doi.org/10.1055/s-0038-1639436

Wallin, E., Falconer, H., & Rådestad, A. F. (2019). Sexual, bladder, bowel and ovarian function 1 year after robot-assisted radical hysterectomy for early-stage cervical cancer. *Acta Obstetricia ET Gynecologica Scandinavica*, *98*(11), 1404–1412. https://doi.org/10.1111/aogs.13680

Wang, T., Wang, V., Vega-Corredor, M., Hoermann, S., Watkins, A., Tomintz, M., Vega-Corredor, M. C., Mappangara, I., Qanitha, A., Gonzalez-Fernandez, R. I., Mulet-Cartaya, M., De Oca-Colina, G. M., Aguilera-Perez, J., Lopez-Cardona, J. D., Hernandez-Caceres, J. L., Fittler, A., Fittler, M., György, R., Mohamad, I., . . . Ozanich, G. (2022). Telehealth and telemedicine - the Far-Reaching medicine for everyone and everywhere. In *Biomedical engineering*. https://doi.org/10.5772/intechopen.100663

Watrowski, R., & Sparic, R. (2022). *Changing backgrounds and groundbreaking changes: Gynecological surgery in the third decade of the 21st century*. Frontiers Media SA.

Wise, L. A., Radin, R. G., Kumanyika, S. K., Ruiz-Narváez, E. A., Palmer, J. R., & Rosenberg, L. (2014). Prospective study of dietary fat and risk of uterine leiomyomata. *American Journal of Clinical Nutrition*, *99*(5), 1105–1116. https://doi.org/10.3945/ajcn.113.073635

Xie, L., Semenciw, R., & Mery, L. (2015). Cancer incidence in Canada: trends and projections (1983–2032). *Health Promotion and Chronic Disease Prevention in Canada*, *35*(Supplement 1), 2–186. https://doi.org/10.24095/hpcdp.35.s1.02

Yates, L. A., Yates, J., Orrell, M., Woods, B., Spector, A., & Woods, R. T. (2018). *Cognitive Stimulation therapy for dementia: History, Evolution and Internationalism*. Routledge.