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Nurse-led interventions among older adults affected by cancer: an integrative review.

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Review

Nurse-led interventions among older adults affected by cancer: An integrative review

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ABSTRACT

Objective: Aging can introduce significant changes in health, cognition, function, social status, and emotional status among older adults affected by cancer. Little is known about how existing nurse-led interventions address the needs of older adults. The objective was to identify existing nurse-led interventions among older adults to optimize recovery and survivorship needs.

Methods: A integrative systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 Guidelines. Electronic databases (APA PsycINFO, CINAHL, MEDLINE, Scopus, and Google Scholar databases) were searched using key search terms. Articles were assessed for inclusion according to a pre-determined eligibility criterion. Data extraction and quality appraisal were conducted. Findings were integrated into a narrative synthesis.

Results: Twenty-one studies were included, and a total of 4253 participants were represented. There were a range of study designs: quantitative (n = 10), randomised controlled trials (n = 6), mixed methods studies (n = 3), qualitative (n = 1), and a non-randomized controlled study (n = 1). Most participants had prostate cancer, with some representation in colorectal, lung, head and neck, renal, esophageal, and mixed cancer patient populations.

Conclusions: This review shows a lack of evidence on the inclusion of geriatric assessments for older people with cancer within existing nurse-led interventions. Further research is needed to test nurse-led interventions with the inclusion of geriatric assessments and their contribution to the multidisciplinary team across the cancer care continuum for various cancer patient populations.

Introduction

As the population ages, significant numbers of older adults will be diagnosed with cancer.[1,2] The care of older adults with cancer is an increasing challenge for multidisciplinary oncology healthcare teams globally.[3] Treatment of older patients with cancer will be an increasing challenge as the population ages because cancer is primarily a disease of older people.[4] Specifically, the 2015 world report on aging and health underscores that the number of people older than 60 years will double by 2050.[2] There is a need to develop new initiatives to improve the quality of care for older adults with cancer and to translate them into broader standards of person-centered care.[5]

Aging can introduce significant changes in health, cognition, function, social status, and emotional status. Therefore, addressing the supportive care needs of the older adult affected by cancer is complex,[6,7] underscoring the importance of comprehensive geriatric assessment and care to improve quality of life, reduce decrements in health, avoid complications, and reduce the risk of hospitalization or prolonged hospital stay. It is essential to integrate geriatric principles of care into oncology,[8] which includes the recognition of: (1) multiple

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chronic conditions; (2) polypharmacy; (3) social determinants of health; (4) screening for geriatric syndromes; and (5) incorporating functional assessments in practice across the cancer care continuum.[9] As aging is related to an alteration in physiologic functions, individualized treatment options for older patients with cancer need to be evaluated.[10] Complex health care conditions in the elderly are multifactorial and compounded by geriatric syndromes (eg, falls, nutritional deficits, sensory loss, cognitive impairment, frailty, multiple chronic conditions, and functional status) that are largely not addressed in oncology care.[6,7,11–13].

Identifying appropriate cancer treatments for older people can be complicated due to the presence of chronic health conditions and different health priorities.[14] Many older people with cancer do, however, tolerate cancer treatments[12] but many will not have access to tailored treatment options sensitive to the complex issues compounded by geriatric health, largely due to a lack of representation in clinical trials.[15] Geriatric conditions and frailty can lead to loss of independence, transition to a higher level of care, longer hospital stays, and higher mortality rates, all of which can negatively impact cancer survivorship and recovery. Furthermore, the majority of older adults living with cancer are likely to have two or more long-term conditions.[16]

Older adults affected by cancer are more likely to have an increased prevalence of multimorbidity compared to those without cancer, as demonstrated in age-matched control group research.[17] The practicalities of implementing comprehensive geriatric oncology models of care have been acknowledged as a stumbling point in clinical services.[18] Challenges often relate to a lack of time and limited access to specialized healthcare professionals who can perform a comprehensive assessment in practice. Oncology nurses are central to the multidisciplinary team (MDT) to promote and optimize patient-centered care for all older adults with cancer and are necessary to achieve optimum care.[19] Internationally, there has been a development of various nurse-led geriatric oncology models of care.[20] However, little is known about oncology nurse-led interventions in older adults, whether comprehensive geriatric assessments are included, and whether nursing assessments and interventions are sensitive to the unique needs of this older patient group. Therefore, this integrative systematic review set out to identify existing nurse-led interventions in older adults affected by cancer to advance future directions for practice and research.[21]

Methods

Design: This integrative systematic review was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.[22] This review also followed a systematic review protocol available on request.

Eligibility criteria

Types of studies

This review included all qualitative, quantitative, and mixed methods studies, irrespective of research design, with the only limit being that they were published in the English language. All commentaries, editorials, and studies involving nurse-led interventions for patients affected by cancer with a mean age of $<$ 65 years were excluded.

Types of participants

All older participants (where studies reported a mean study age of $\geq$ 65 years) diagnosed with cancer (irrespective of cancer stage, treatment, or time since diagnosis) and receiving a nurse-led intervention were included. All other long-term conditions, younger study samples $<$ 65 years, and non-nurse-led interventions were excluded.

Types of outcomes

The primary outcome of this review was related to supportive care needs provided by nurse-led interventions for older adults in study samples with a mean age of $\geq$ 65 years. The Supportive Care Needs Framework[6] guided the classification of supportive care provided by nurse-led interventions through the identification of the inclusion of comprehensive geriatric assessments.

Literature search

The APA PsycINFO, CINAHL, MEDLINE, Scopus, and Google Scholar databases were searched from inception to September 2022 for all relevant studies published. To capture as many studies as possible, the database search architecture utilized a wide range of key words (nurse-led OR nurse-managed), (care OR model* OR program* OR intervention*), AND (cancer* OR oncology* OR neoplasm*) designed and conducted by an expert systematic review librarian, see Supplementary Table 1. Limiters were placed on all searches for studies published in the English language no other limiters were set to ensure all nurse-led interventions were identified as being as inclusive and sensitive as possible. All articles were assessed independently by two reviewers to identify studies in older people (where studies reported a mean study age of $\geq$ 65 years) diagnosed with cancer (irrespective of cancer stage, treatment, or time since diagnosis) and receiving a nurse-led intervention. The reference lists of all the full-text articles included were checked to identify any other relevant studies. Citations were managed with EndNote 20 and imported into Covidence systematic review software to facilitate the systematic review process.

Table 1
Classification of supportive care needs.

Domain of need	Description
Physical needs	Experience of symptoms such as fatigue, pain, etc., co-morbidities, nutritional deficits, frailty, and functional status.
Psychological/ emotional needs	Experience of depression, anxiety, sadness, fear, distress, etc.
Cognitive needs	Individual experience of cognitive impairment or decline, memory problems, sensory loss, etc.
Patient-clinician communication needs	Quality of communication and coordination between patients and health care professionals, shared decision-making, etc.
Health system/ information needs	Information needs, uncertainty of follow-up, lack of information about diagnosis and treatment, etc.
Spiritual needs	Fear of death and dying, fears regarding the afterlife, etc.
Daily living needs	Experience of restrictions to daily living, exercise, housekeeping, etc.
Interpersonal/ intimacy needs	Experience of difficulties with body image, masculinity, sexual dysfunction, compromised intimacy with a partner, etc.
Practical needs	Related to daily task restrictions, employment, accessing benefits, life insurance, etc.
Family related needs	Experience of fears/concerns in the family, dysfunctional relationships, etc.
Social needs	Experience of reduced social support, social isolation, loneliness, lack of peer support, etc.

Selection of studies

Duplication of publications was removed in Covidence. All titles and abstracts were independently screened by three reviewers for eligibility, and any disagreements were resolved by discussion. Full-text publications were then retrieved, independently screened by reviewers, and linked multiple records of the same study together. Any disagreements were resolved by discussion, and reasons for exclusion were documented.

Data extraction and management

Data extraction were performed on the retained full-text studies meeting the inclusion criteria. The data were extracted by three reviewers and independently quality checked among all reviewers for accuracy and quality assurance in the process. The data extraction tables were developed, tested on a small sample of studies, and then further refined through discussion among the reviewers. The first table of data extraction included information on the purpose, setting, country, sample size, participant characteristics, sampling used, response rate, attrition, design, time points, and data collection tools. The second data extraction table related to the nurse-led interventions and the supportive care needs outcome data (Table 1).[23]

Assessment of risk of bias in included studies

The included full-text studies all underwent a methodological quality assessment. None of the studies were excluded basedon their methodological quality score to enable a comprehensive overview of the current state of the evidence. The methodological quality assessment was conducted using the Mixed Methods Assessment Tool (MMAT).[24] The MMAT tool was selected because it enabled a plethora of study designs to be critically appraised. This assessment tool enabled the critical appraisal of all qualitative, quantitative, and mixed-methods studies. Each domain of assessment was rated against "no", "yes" and "unclear". Methodological quality assessment was performed by one reviewer and quality checked by a second reviewer until consensus was reached.

Data synthesis

This integrative systematic review used a narrative synthesis.[25] The steps in the narrative synthesis involved: (1) data reduction by tabulation; (2) data comparison between studies; and finally; (3) drawing conclusions. This process involved reading and re-reading full-text publications, linking similarities and differences between the studies, and quality checking with the primary sources. The data comparison phase involved the reviewers' identifying patterns and themes through counting, clustering, and making comparisons across the study findings in tabulated format, grouped together by cancer type. The data synthesis were conducted by two authors and checked by a third author.

Results

The search identified a total of 1244 publications, see Fig. 1. A total of 106 full-text articles were assessed, and 85 were excluded with reasons (Fig. 1). The included studies were conducted in a range of countries including the United Kingdom ($n = 13$), the United States of America ($n = 3$), Italy ($n = 1$), the Netherlands ($n = 2$), Australia ($n = 1$), and Sweden ($n = 1$), see Table 2 for an overview of the included studies. Across the included studies, the sample sizes ranged from 13 to 815, with a total of 4253 participants represented in this review. There were a range of study designs: quantitative ($n = 10$)[26–35], randomized controlled trials ($n = 6$)[36–41], mixed methods studies ($n = 3$)[42–44], qualitative ($n = 1$)[45], and a quantitative non-randomized controlled study ($n = 1$).[46] The majority of the participants included had prostate,[27,30,33,34,39,40,44,45] colorectal,[32,42] lung,[41,43] head and neck,[46] renal,[35] esophageal[37] and mixed cancer.[26,28,29,31,36,38] The methodological quality of the included studies was overall good, but some caution should be taken in the interpretation of the results due to non-response bias and a lack of acknowledgment of

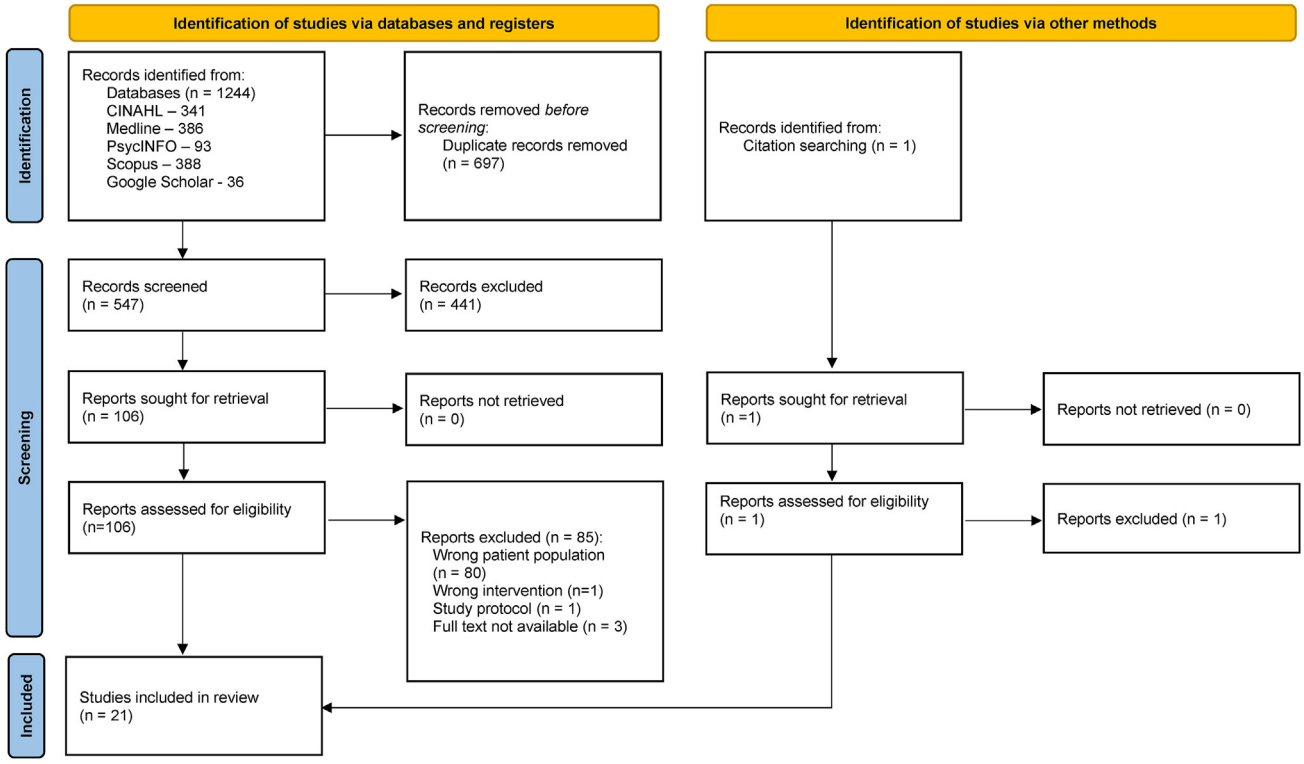

Fig. 1. PRISMA diagram.

Table 2
Overview of the included studies.

Author, year and country	Purpose	Sample and age (mean)	Participants (cancer, stage, treatment)	Design	Data collection tools comprehensive geriatric assessment (CGA)
Bigelow et al, 2021[25] USA	To describe the implementation, associated interventions, and outcomes of the PFRC's proactive virtual resource center navigation model.	Sample size: 586 65 years	Cancer: Most common were haematological, breast. and gastrointestinal. Cancer stage: Not reported Treatment: Surgery, radiation, chemotherapy, or other systemic treatments	Quality improvement study	Referral information, patient demographics, risk characteristics, visit data, interventions, and outcomes CGA: not included.
Casey et al, 2017[26] UK	To evaluate patient satisfaction with a nurse-led phone call follow up clinic for patients with prostate cancer.	Sample size: 815 75 years	Cancer: Prostate cancer Cancer stage: Mixed Treatment: Surgery, radiotherapy, combined surgery and radiotherapy, brachytherapy, hormone manipulation	Satisfaction survey	Satisfaction survey CGA: not included.
Catania et al, 2021[27] Italy	To pilot a nurse-led complex intervention focused on QoL assessment in advanced-stage cancer patients.	Sample size: 187 74 years	Cancer: Mixed Cancer stage: Advanced disease/last phase of life Treatment: Not reported	Quasi-experimental design	Integrated Palliative Care Outcome Scale (I-POS) CGA: not included. Cognitively impaired patients were excluded.
Craven et al, 2012[28] UK	A prospective audit exploring the usefulness of a nurse-led telephone intervention for supporting cancer patients treated with Capecitabine.	Sample size: 462 65 years	Cancer: Colorectal and breast Cancer stage: Not reported. Treatment: Capecitabine	Longitudinal prospective evaluation	The National Cancer Institute Common Toxicity Criteria (NCI-CTC) patient satisfaction questionnaire was completed. CGA: not included.
Faithfull et al, 2001[35] UK	To compare outcomes in terms of toxicity, symptoms experienced, quality of life, satisfaction with care and health care costs between those receiving nurse-led care vs. group receiving standard care.	Sample size: 115 70 years	Cancer: Prostate and bladder Cancer stage: Mixed Treatment: Radiotherapy	RCT	Observer-rated RTOG Toxicity scores, EORTC QLQ C30, Satisfaction Questionnaire, Economic Appraisal Information CGA: not included.
Ferguson and Aning, 2015[29] UK	To describe the implementation of a nurse-led survivorship program for men with prostate cancer.	Sample size: 76 65 years	Cancer: Prostate Cancer stage: Not reported Treatment: Robotic radical prostatectomy, laparoscopic radical prostatectomy, radiotherapy, ADT, active surveillance, chemotherapy	Service evaluation	Clinical and demographic data CGA: not included.
Festen et al, 2019[30] Netherlands	To evaluate nurse-led geriatric assessment and assessment of patient preferences for oncological treatment decisions for older patients with solid malignancy.	Sample size: 197 78 years	Cancer: Mixed Cancer stage: Mixed Treatment: Curative intent: 159 (80.7%), palliative intent: 38 (19.3%)	Prospective cohort study	CGA: Yes. GA involved an evaluation in four domains: somatic, social, psychological, and functional. Polypharmacy was defined as taking $\geq$ 5 prescription drugs. The Groningen Frailty Indicator (GFI), the letter fluency test (LFT), was used as a measure of cognition, and the Timed Up and Go (TUG) test was used as a measure of mobility, The Groningen Activity Restriction Scale (GARS) is a combination of Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (iADL), Outcome Prioritization Tool (OPT), and Charlson Comorbidity Index (CCI).
Knowles et al, 2007[31] UK	To assess the feasibility of a follow-up program led by a nurse specialist for patients with colorectal cancer.	Sample size: 60 67 years	Cancer: Colorectal Cancer stage: Mixed Treatment: Short course Radiotherapy, Colectomy, Resection, Chemotherapy and Radiation	Pilot study	QLQ-C30, QLQ-CR38, Satisfaction Questionnaire CGA: not included.
Kotronoulas et al, 2017[41] UK	To explore the feasibility and acceptability of PROMs-driven, CNS-led consultations to enhance delivery of supportive care to people with CRC completing adjuvant chemotherapy.	Sample size: 13 65 years	Cancer: Colorectal Cancer stage: Mixed Treatment: Surgery, chemotherapy, radiotherapy	Systematic literature review, focus groups and repeated measure exploratory study	Supportive Care Needs Survey-Short Form 34 (SCNS-SF34), Twelve patients initially consented to end-of-study interviews. CGA: not included.

(*continued on next page*)

Table 2 (*continued*)

Author, year and country	Purpose	Sample and age (mean)	Participants (cancer, stage, treatment)	Design	Data collection tools comprehensive geriatric assessment (CGA)
Kotronoulas et al, 2018[42] UK	To examine whether a nurse-led PRO measure-driven approach is feasible and acceptable for identifying unmet needs in patients with lung cancer.	Sample size: 20 67 years	Cancer: Lung Cancer stage: Mixed Treatment: Not reported	Mixed methods	Nine patients with lung cancer (6 men and 3 women) took part in interviews. The Sheffield Profile for Assessment and Referral to Care (SPARC) CGA: not included.
Malmstrom et al, 2016[55] Sweden	To evaluate the effect of a nurse-led telephone supportive care program on QoL compared to conventional care on patients following esophageal resection for cancer.	Sample size: 82 66.4 years	Cancer: Esophageal cancer Cancer stage: Not reported Treatment: Esophagectomy or oesophago-gastrectomy	RCT	QLQ-C30, QLQ-0625, QLQ-INFO25. CGA: not included.
Martin et al, 2018[32] UK	To evaluate a nurse-led service for men affected by PC on AS.	Sample size: 104 patients 66 years	Cancer: Prostate Cancer stage: Localized prostate cancer Treatment: Active surveillance	Retrospective audit, patient satisfaction survey, and staff satisfaction survey	National Cancer Patient Experience Survey CGA: not included.
McGlynn et al, 2014[33] UK	A local evaluation of the nurse-led collaborative care model for the management of patients with prostate cancer.	Sample size: 71 No mean age provided. Participants aged approximately between 63 and 82 years	Cancer: Prostate Cancer stage: Not reported. Treatment: Not reported	Retrospective audit, patient satisfaction survey, and staff satisfaction survey	Patient satisfaction questionnaire. CGA: not included.
Primeau et al, 2017[44] UK	To explore the experience of patients and their partner/caregiver, as well as MDT members, of a nurse-led multimodality supportive care intervention in men with metastatic prostate cancer as well as standard care.	Sample size: 19 patients, 7 partners/ caregivers, 7 MDT members Range 67–84 years	Cancer: Prostate Cancer stage: Metastatic Treatment: Androgen deprivation therapy	Qualitative study	Semi-structured interviews. CGA: not included.
Ream et al, 2009[43] UK	To investigate the role of Prostate Cancer Clinical Nurse Specialists and determine their targeted services, work practices, and perceived contribution.	Sample size: 4 PCNS, 19 clinical colleagues, 40 patients 67 years	Cancer: Prostate Cancer stage: Not reported Treatment: Prostatectomy, radiotherapy, hormone therapy, active monitoring, brachytherapy, cryotherapy, chemotherapy	Mixed method design	Nurse diary based on prototypes developed by Macmillan's and interviews. CGA: not included.
Reinke et al, 2022[40] USA	To assess the effect of a nurse-led telephone-based primary palliative care intervention for patients with lung cancer.	Sample size: 151 70 years	Cancer: Lung Cancer stage: 64% III-IV Treatment: Mixed	RCT	FACT-L, Satisfaction with care was measured using the FAMCARE-P13 Patient Scale. CGA: not included.
Schenker et al, 2021[37] USA	To assess the effect of CONNECT (Care Management by Oncology Nurses to Address Supportive Care Needs).	Sample size: 672 69 years	Cancer: The most common cancers lung and gastrointestinal Cancer stage: Not reported Treatment: Chemotherapy, radiotherapy, hormonal therapy, immunotherapy	RCT	Functional Assessment of Chronic Illness Therapy-Palliative care, Edmonton Symptom Assessment Scale, Hospital Anxiety and Depression Scale, ECOG Performance Status score CGA: not included.
Schofield et al, 2016[38] Australia	To investigate the benefits of a group nurse-led intervention in men receiving radiotherapy for Prostate Cancer.	Sample size: 331 67.2 years	Cancer: Prostate Cancer stage: Not reported Treatment: Surgery, radiotherapy, hormonal therapy	RCT	HADS, CaTS, SCNS-SF 34-F, EPIC-26, DT CGA: not included.
Sibbons et al, 2019[34] UK	To evaluate a nurse-led service for patients affected by renal cancer.	Sample size: 89 67 years	Cancer: Renal Cancer stage: Not reported Treatment: Partial nephrectomy and radical nephrectomies	Clinical audit and service evaluation	Retrospective clinical audit of medical records and patient satisfaction survey CGA: not included.
Stanciu et al, 2018[39] UK	To evaluate a nurse-led model of personalized care after prostate cancer treatment.	Sample size: 45 (intervention), 47 (control group) range 66–94 years old	Cancer: Prostate Cancer stage: Mixed Treatment: Surgery, radiotherapy, hormone therapy, or deemed unlikely to receive further treatment (watchful waiting)	RCT	Clinical and demographic data, EPIC-26, HADS, SCNS-SF34, EQ-5D-5L, CSRI, Confidence Managing Own Health, Satisfaction with Healthcare Survey CGA: not included.

(*continued on next page*)

Table 2 (*continued*)

Author, year and country	Purpose	Sample and age (mean)	Participants (cancer, stage, treatment)	Design	Data collection tools comprehensive geriatric assessment (CGA)
van der Meulen et al, 2013[45] Netherlands	To test a nurse-led educational intervention for patients with head and neck cancer.	Sample size: 48 65 years	Cancer: Head and neck Cancer stage: Not reported Treatment: Radiotherapy	Quasi-experimental study	PINQ, SCIP CGA: not included.

ADT, Androgen Deprivation Therapy; AS, Active Surveillance; CaTS, Cancer Treatment Scale; C15, Tumours of the Oesophagus; C16.0, Malignant Neoplasm of Cardia; CNS, Clinical Nurse Specialist; CSRI, Client Service Receipt Inventory; DRE, Digital Rectal Examination; DT, Distress Thermometer; EBRT, External Beam Radiotherapy; EORTC QLQ-C30, European Organisation for the Research and Treatment of Cancer Quality of Life Questionnaire; EPIC-26, Expanded Prostate Cancer Index Composite Short -form; EQ-5D-5L, EuroQoL EQ-5D-5L; GFI, Groningen Frailty Indicator; HADS, Hospital Anxiety and Depression Scale; INFO-QoL, Intervention Focused on Quality of Life; LUTS, Lower Urinary Tract Symptoms; Nodal (N), extent of the tumour; PCNS, Prostate Cancer Nurse Specialist; PFRC NN, Patient and Family Resource Center Nurse Navigator; PINQ, Patient Information Need Questionnaire; PRO, Patient Reported Outcome; PSA, Prostate Specific Antigen; QLQ-INFO25, Perceived level of information; QLQ-0625, European Quality of Life in Cancer of Oesophagus, Oesophagogastric junction or Stomach; QLQ-C30, European Organisation for Research and Treatment of Cancer Quality of Life with Cancer; QoL, Quality of Life; RCT, Randomised Controlled Trial; RTOG, Radiation Therapy Oncology Group; SCIP, Satisfaction with Cancer Information Profile; SCNS-SF34-R, Supportive Care Needs Short Form Revised; SCNS-SF36, Supportive Care Needs Survey Short-Form; SPARC, Sheffield Profile For Assessment and Referral to Care; SRM, Standardised Response Mean; TURP, Transurethral Resection of the Prostate; ECOG, Eastern Cooperative Oncology Group; PROMs, Patient-reported outcome measures; MDT, multidisciplinary team.

the divergence between the qualitative and quantitative data in the mixed methods studies, see Table 3.

Types of nurse-led interventions

The nurse-led interventions were cancer-specific and included: prostate,[27,30,33,34,39,40,44,45] colorectal,[32,42] lung,[41,43] head and neck,[46] renal,[35] radiotherapy,[36] palliative care,[28,38] virtual-telephone[26] and only one geriatric-oncology[31] intervention, see Table 4. Heterogeneity existed in the nurse-led interventions for patients $\geq$ 65 years in terms of the duration, composition, mode of delivery, and outcomes measured to quantify their impact. Given that the types of nurse-led interventions were cancer-specific, the findings of this review have been synthesized according to cancer type, with the underpinning clinical rationale that each type of cancer has its own unique implications and requirements for supportive care.[23]

Prostate cancer nurse-led interventions

It is unsurprising that most of the included nurse-led interventions were focused on the clinical management of prostate cancer, given that this is largely a disease among older men. Nurse-led interventions were focused on mixed treatment groups and stages,[27,30,39,40,44] active surveillance,[33] men on androgen deprivation therapy for metastatic disease,[45] and the stage and treatments were not reported in one study.[34] For most of the studies, it was unclear how the nursing process was implemented to assess, plan, implement interventions, and evaluate patient care outcomes within the reported interventions. The inherent lack of information about the nursing process is an important omission in the included studies. Consequently, little is known about the cycle of decision-making that nurses used to capture (assess) patient information, how they created care plans and implemented interventions, and what strategies were used to evaluate whether care episodes were effective or not. Five studies used Patient-reported outcome measures (PROMs) to collect information to assess lower urinary tract symptoms (International Prostate Symptom Score [IPSS])[27] or used a comprehensive holistic assessment tool.[30,39,40,45] Most of the prostate cancer nurse-led interventions did not report how they performed their clinical assessments to determine the patients' baselines or deterioration in symptoms, including timely identification of risk factors such as nutritional deficits, falls, cognitive impairment, frailty, multiple chronic conditions, and functional status. Two of the included studies[30,45] delivered an educational program that focused on treatment, side-effects, and self-management strategies. One study delivered a nurse-led telephone service[27] and the majority of the participants reported that they found the intervention to be convenient, informative, reassuring, and beneficial in terms of cost savings due to travel. Despite a clear lack of assessment of geriatric oncology risk factors among men who received nurse-led interventions for prostate cancer, men articulated value because they were provided with self-management support to reduce distress and recover from treatment side-effects including both physical and psychological difficulties.[30,33,39] Commonly, patients reported that they were treated with dignity and respect, listened to, and had time to ask questions,[34,45] and that they were happy to see the specialist nurse for prostate cancer follow-up care compared to consultants.[33,45] Studies demonstrated cost-effectiveness in nurse-led interventions for prostate cancer compared to consultant-led care.[36,38]

Nurse-led models of colorectal cancer care

There were only two studies[32,42] which explored nurse-led interventions in care among people affected by colorectal cancer. Both studies did not include nurse-led geriatric assessments, but one study used the Supportive Care Needs Survey (SCNS)[42] to tailor consultations and improve supported self-management tailored to areas of patient distress or concern. All patients were satisfied with the nurse-led intervention, with reported reductions in physical and psychological symptoms and improved access to timely informational support. Patients

valued using the SCNS to bring their needs and concerns to the forefront of the consultation.[32,42] The cost savings reported from the UK-based studies were estimated to save £28,030 to the National Health Service (NHS).[32]

Lung cancer nurse-led interventions

Two studies explored nurse-led interventions among people living with lung cancer, and both did not include comprehensive geriatric assessments.[41,43] One study explored the routine use of PROMS (Sheffield Profile for Assessment and Referral to Care [SPARC]) in identifying unmet supportive care needs to tailor individualized support.[43] Patients reported improved symptom management and reduced distress caused by breathlessness, with a sense of improved control and empowerment as active partners in their own care.[43] Patients felt that the time with the specialist nurse enabled them to build rapport and have one-on-one time to explore sensitive issues such as death and dying, family, and sexuality-related issues. Whereas the second study explored a palliative care nurse-led educational intervention to optimize symptom management in people diagnosed with advanced lung cancer compared to standard care (albeit standard care was not described in the context of this study).[41] This study[41] did not report any statistically significant differences in quality of life or satisfaction with care between both study arms. No cost-effectiveness outcome data were included in either study.

Head and neck cancer nurse-led interventions

This intervention was tested among 48 participants diagnosed with head and neck cancer and treated by radiotherapy.[46] The intervention included a structured consultation with a specialist nurse and covered a variety of self-care topics related to psychosocial concerns, wound care, work, and financial support. There were no PROMS to structure the consultation or evidence of consideration to include comprehensive geriatric assessments in this older patient population.

Renal cancer nurse-led interventions

A single study provided insights into a nurse-led intervention for renal cancer surveillance for patients treated by either partial or total nephrectomy.[35] There were no details on the nurse-led intervention in terms of the nursing process of care, no considerations of comprehensive geriatric assessments, or documented survivorship care plans. The model of care was largely focused on cancer surveillance only and lacked information on the contribution of nursing support to address survivorship issues in this patient group.

Palliative care nurse-led intervention

Two studies[28,38] delivered nurse-led palliative interventions among patients with different cancers. Both nurse-led interventions involved educational and informational support to optimize symptom control and quality of life, nurse-patient-family engagement in advanced care planning, and a daily multidisciplinary staff briefing about holistic person-centered care with clear goals and documented preferences for care. Of note, both studies did not include comprehensive geriatric assessments in this patient population with a mean age of 74 years,[28] and 69 years, respectively[38] Both studies identified improvements in physical and psychological wellbeing in favor of nurse-led interventions.

Nurse-led interventions among mixed cancer groups

Only two studies[26,36] explored nurse-led interventions for care among patients diagnosed with different cancers as opposed to single-tumor-specialized nursing interventions. One study[26] explored a virtual intervention during the COVID-19 pandemic. Patients were diagnosed with various types of cancer; the most common were breast, gastrointestinal, and hematological. The nurse-led consultation was conducted via telephone or video call to provide timely support and assess practical daily living needs. Patients reported that they received emotional support, COVID-19 education and nutritional advice,

Table 3
Results of quality assessment.

Qualitative study	Item number of checklist						
	S1	S2	1.1	1.2	1.3	1.4	1.5
Primeau et al. 2017 [44]	Y	Y	Y	Y	Y	Y	Y
Item number checklist key: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 1.1. Is the qualitative approach appropriate to answer the research question, 1.2. Are the qualitative data collection methods adequate to address the research question, 1.3. Are the findings adequately derived from the data, 1.4. Is the interpretation of results sufficiently substantiated by data, 1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation.							
Quantitative randomised controlled trials	Item number of checklist						
	S1	S2	2.1	2.2	2.3	2.4	2.5
Faithfull et al. 2001 [35]	Y	Y	Y	Y	Y	U	Y
Malmstrom et al. 2016 [55]	Y	Y	Y	Y	Y	Y	Y
Reinke et al. 2022 [40]	Y	Y	U	Y	Y	U	U
Schofield et al. 2016 [38]	Y	Y	Y	Y	Y	Y	U
Schenker et al. 2021 [37]	Y	Y	Y	Y	Y	Y	U
Stanciu et al. 2018 [39]	Y	Y	Y	Y	Y	Y	Y
Item number check list key: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 2.1. Is randomisation appropriately performed, 2.2. Are the groups comparable at baseline, 2.3. Are there complete outcome data, 2.4. Are outcome assessors blinded to the intervention provided, 2.5. Did the participants adhere to the assigned intervention							
Quantitative non-randomised controlled trials	Item number of checklist						
	S1	S2	3.1	3.2	3.3	3.4	3.5
Van der Meulen et al. 2013 [45]	Y	Y	Y	Y	Y	U	Y

S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 3.1. Are the participants representative of the target population, 3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure), 3.3. Are there complete outcome data, 3.4. Are the confounders accounted for in the design and analysis, 3.5. During the study period, is the intervention administered (or exposure occurred) as intended

Quantitative descriptive studies	Item number of checklist						
	S1	S2	4.1	4.2	4.3	4.4	4.5
Bigelow et al. 2021 [25]	Y	Y	Y	Y	Y	Y	Y
Casey et al. 2017 [26]	Y	Y	Y	U	Y	U	Y
Catania et al. 2021 [27]	Y	Y	Y	U	Y	U	Y
Craven et al. 2012 [28]	Y	Y	Y	U	Y	U	Y
Festen et al. 2019 [30]	Y	Y	Y	Y	U	U	Y
Ferguson and aning 2015 [29]	Y	Y	Y	Y	U	U	Y
Knowles et al. 2007 [31]	Y	Y	U	Y	Y	Y	Y
Martin et al. 2018 [32]	Y	Y	Y	Y	U	U	Y
McGlynn et al. 2014 [33]	Y	Y	Y	U	U	U	U
Sibbons et al. 2019 [34]	Y	Y	Y	U	U	U	Y

Item number check list key: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 4.1. Is the sampling strategy relevant to address the research question, 4.2. Is the sample representative of the target population, 4.3. Are the measurements appropriate, 4.4. Is the risk of non-response bias low, 4.5. Is the statistical analysis appropriate to answer the research question

Mixed methods	Item number of checklist						
	S1	S2	5.1	5.2	5.3	5.4	5.5
Kotronoulas et al. 2017 [41]	Y	Y	Y	Y	Y	U	Y
Kotronoulas et al. 2018 [42]	Y	Y	Y	Y	Y	U	Y
Ream et al. 2009 [43]	Y	Y	Y	Y	Y	U	Y

Item number check list key: S1. Are there clear research questions, S2. Do the collected data allow to address the research questions, 5.1. Is there an adequate rationale for using a mixed methods design to address the research question, 5.2. Are the different components of the study effectively integrated to answer the research question, 5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted, 5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed, 5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved

Three levels of assessment quality scores

Yes (Y)
Unclear (U)
No (N)

medication support, and signposting for financial assistance.[26] The second study[36] provided a nurse-led radiotherapy intervention for mixed cancer groups. The intervention provided education, informational support, and practical advice to optimize self-management throughout radiotherapy treatment.[36] Physical and psychological well-being among the participants was favorable of the intervention arm compared to standard treatment. Participants articulated that they felt that their needs and concerns were taken seriously and that they valued the experience of continuity of care. No comprehensive geriatric assessments were conducted in either of these studies.

Geriatric oncology nurse-led intervention

Only one study[31] explored nurse-led geriatric oncology intervention in 197 participants with a mean age of 78 years. This study represented mixed cancer patient groups, and the geriatric assessment involved somatic, social, psychological, and functional assessments. Polypharmacy considerations were considered for participants taking five or more prescription drugs. Frailty was assessed using both the Groningen Frailty Indictor and the letter fluency test to measure cognition. Other assessments included mobility, activities of daily living, and co-morbidity. The central premise of this nurse-led intervention was to embed comprehensive geriatric assessments and the patients' preferences within an MDT oncogeriatric approach to tailor cancer treatment recommendations. Over half (52.3%) of the patients were frail, at risk of polypharmacy (52.7%), and experiencing cognitive decline. Of note, 27% of the cancer treatment recommendations for the patients within the nurse-led oncogeriatrics MDT differed from the cancer tumor board MDT treatment recommendations, and the modifications were largely related to less intensive or invasive treatments.

Discussion

This integrative systematic review set out to identify existing nurse-led interventions among older adults across all different cancer types. Of the 21 included studies within this review, only one study[31] incorporated comprehensive geriatric nurse-led assessments, underscoring fundamental shortcomings within existing nurse-led interventions for the older person with cancer.[47] This review has identified that nurse-led interventions are highly specialized by cancer type only and lack the integration of geriatric assessments within the multidisciplinary team.

Table 4
Overview nurse-led interventions in older adults affected by cancer.

Author and year	Purpose	Intervention
Bigelow et al, 2021[25]	To describe the implementation, associated interventions, and outcomes of the PFRC's proactive virtual resource center navigation model.	This virtual nurse-led intervention will reduce barriers to care during the pandemic. The nurse navigator determines the complexity of needs and risk factors and then triages them to the appropriate team member. Visits were completed by phone or video. When unmet need is identified, respective interventions, internal or external such as financial relief, food pantry resources, external referrals, transport, and educational support, are provided.
Casey et al, 2017[26]	To evaluate patient satisfaction with a nurse-led phone call follow-up clinic for patients with prostate cancer.	A nurse-led telephone follow-up service for patients with stable prostate cancer. A satisfaction survey was used to assess patients satisfaction with the service. All patients were assessed every 6 months by phone at a pre-agreed time and date. This consisted of a recent PSA test and assessment of IPSS score, ECOG status, and side effects from treatment or any new symptoms consistent with local or metastatic disease progression. Triggers to discuss patients with their consultant included any change in symptoms or rise in PSA nadir.
Craven et al, 2012[28]	To explore the usefulness of a nurse-led telephone intervention for supporting cancer patients treated with Capecitabine.	A nurse-led telephone follow-up service. Patients were assessed at baseline and thereafter had two phone calls during cycle 1 (Days 3 & 10) and one phone call during cycle 2 (Day 10). The call duration was 5–10 min (10–15 min for new patients). Chemotherapy booklet and written information about capecitabine and related toxicities. Patients were given the 24-h 'hotline' phone number of the cancer center.
Catania et al, 2021[27]	To pilot a nurse-led complex intervention focused on QoL assessment in advanced-disease cancer patients.	The INFO-QoL intervention aimed to improve patients' outcomes and overall QoL in advanced-disease cancer patients with palliative care needs. There are three main components: (1) a small group interdisciplinary team educational program focusing on QoL issues and interventions that promote better outcomes in advanced-disease cancer care; (2) nurse-patient and nurse-family face-to-face interaction to educate patients and their families on QoL issues; (3) patients' outcomes and QoL assessment and appointing a nurse in charge of the process. The care plan was developed during the daily multidisciplinary staff briefing and included changing treatments/routes of administration, monitoring vital signs, providing emotional support, educating patients and their families about the illness and options for care based on their goals and preferences, and initiating decision-making conversations.
Faithfull et al, 2013[35]	To compare outcomes in terms of toxicity, symptoms experienced, quality of life, satisfaction with care, and health care costs between those receiving nurse-led care and groups receiving standard care.	This nurse-led intervention approach explors patients' understanding of cancer diagnosis and symptoms, provids information and practical advice, and distributes leaflets on healthy eating and radiotherapy in outpatient appointments for 20 min. Telephone contact was also maintained between clinic appointments to assess health status. Contact was established at the start of radiotherapy and continued throughout treatment until 12 weeks. The provision of information and practical advice on how to recognize early symptoms, what to expect from treatment, and how to manage existing problems were considered. A protocol of medication and management for symptoms was agreed upon with the responsible consultants.
Ferguson and Aning, 2015[29]	To describe the implementation of a nurse-led survivorship program for men with prostate cancer.	This nurse-led intervention delivers a survivorship program. Patients were given an overview of the role of the survivorship nurse specialist and then invited to attend face-to-face appointments for 45 min at 10 weeks post-treatment, 6 months and 1 year. All men were also invited to attend a 6-week course of "Living with and Beyond" education. The educational program was developed in collaboration with staff at the Maggie's Center (prostate cancer overview, radiotherapy overview, side-effects of hormone therapy, post-prostatectomy continence, psychosexual implications of treatment).
Festen et al, 2019[30]	To evaluate nurse-led geriatric assessment and assessment of patient preferences for oncological treatment decisions for older patients with solid malignancy.	This nurse-led intervention included the integration of geriatric assessment and assessment of patients preferences in a multidisciplinary approach to reach tailored treatment advice. Inclusion of the study took place in the outpatient clinic, where patients will be discussed in the conventional tumor board, as well as in the onco-geriatric MDT, where nurses had an active role to compare recommendations and implementation purposes.
Knowles et al, 2007[31]	To assess the feasibility of a follow up program led by a nurse specialist for patients with colorectal cancer.	This nurse-led intervention included placement of the CNS in the multidisciplinary team to coordinate follow-up programs with adherence to follow-up protocols at each clinic visit. A baseline QoL is measured pre-operatively and then at each of the 4 visits. A questionnaire, which is a self-rated tool, is then used at the 12-month follow-up. Clinician satisfaction is also used at the completion of the study.
Kotronoulas et al, 2017[41]	To explore the impact of nurse-led PROMS consultation with patients.	This nurse-led intervention included a pre-consultation PROM (SCNS). Data were collected during three consecutive, monthly consultations, and used by the CNS to enable delivery of personalized supportive care.
Kotronoulas et al, 2018[42]	To examine whether a nurse-led PRO measure-driven measure is feasible and acceptable for identifying unmet needs in patients with Lung Cancer.	This nurse-led intervention included three consecutive monthly consultations with patients using the PRO measure. Subsequently, the lung CNS met with the patient and used PRO data to identify unmet needs, direct discussions, and intervene accordingly. The lung CNS documented any identified needs and clinical interventions/advice.
Malmstrom et al, 2016[55]	To evaluate the effect of a nurse-led telephone supportive care program on QoL compared to conventional care on patients following esophageal resection for cancer.	This nurse-led intervention included a meeting before discharge where the patients had the opportunity to ask questions, discuss their concerns, and receive both oral and written information focusing on life after surgery, self-care, plans for the future, and where to turn for help if needed. After discharge, the follow-up by the nurse was proactive and focused on the patients individual needs for support as well as areas known to be problematic for patients after this type of surgery, eg, nutrition, elimination, pain, and psychological issues, aiming to detect possible problems at an early stage and help patients manage them.
Martin et al, 2018[32]	To explore the impact of nurse-led service among men undergoing AS for prostate cancer.	The nurse-led intervention included nurse assessment of current health status (and sexual function/ability, where appropriate) and LUTS symptoms, review of PSA and other biochemical results, DRE at 6/12 intervals or if LUTS deteriorated, tailored discussion of all findings with patient ± spouse/partner/carer and offer copy of clinic letter, arrange 2 yearly transrectal ultrasound/template biopsies or sooner if PSA/DRE deteriorates ± MRI, arrange follow-up and arrange PSA before next visit. A clear rationale and trigger for the safety net to refer to consultants.
McGlynn et al, 2014[33]	A local evaluation of the innovative nurse-led collaborative care model for the management of patients with prostate cancer.	A nurse-led collaborative care model for the management of patients with prostate cancer. The nurse makes a full assessment and advises/plans further management appropriately, with advice as required either from the nurse consultant or a consultant/medical team. All patients have contact details for the urology-oncology nursing team and are encouraged to be in touch as required.
Primeau et al, 2017[44]	To explore the experience of patients and their partner/caregiver, as well as MDT members, of a nurse-led multimodality supportive care intervention in men with metastatic prostate cancer as well as standard care.	This nurse-led intervention included patients and their partners/caregivers by completing a holistic needs assessment prior to routine three-month follow-up. A clinical review is then conducted by the PCNS, which lasts for 40–90 min. Information which used to identify supportive care needs and tailor self-management support through ThriveCare intervention.
Ream et al, 2009[43]	To investigate the roles of Prostate Cancer Clinical Nurse Specialists and determine their targeted services, work practices and perceived contribution.	This nurse-led intervention related to caring activities related to care coordination, emotional care, treatment advice, symptom assessment and management, giving results, treatment administration, preoperative preparation, and monitoring at-risk patients.

(*continued on next page*)

Table 4 (*continued*)

Author and year	Purpose	Intervention
Reinke et al, 2022[40]	To assess the effect of a nurse-led telephone-based primary palliative care intervention in patients with lung cancer.	This nurse-led intervention included a one-day End-of-Life Nursing Education Course for Veterans diagnosed with lung cancer, an 8-h online communication course, and nurse support and education on lung cancer symptom management.
Schenker et al, 2021[37]	To evaluate a palliative nurse-led model.	The CONNECT intervention included three-month visits with an existing infusion room nurse who was trained to address symptoms, provide emotional support, engage in advance care planning, and coordinate care. Conceptually grounded in the chronic care model described by Wagner and colleagues, CONNECT used an oncology nurse-led care management approach to improve the provision of primary palliative care within outpatient oncology practices.
Schofield et al, 2016[38]	To investigate the benefits of a group nurse-led intervention in men receiving radiotherapy for prostate cancer.	The intervention package was designed to: 1) systematically assess patient needs and values to direct the content of consultations; 2) provide timely information on basic prostate anatomy, side effects, treatment, and survivorship issues at critical points in the treatment trajectory; 3) coach men in evidence-based self-care and communication strategies with their treatment team to assist them in achieving optimal health status; and 4) offer a forum for psychosocial peer support and information exchange. It consists of four group consultations and one individual consultation.
Sibbons et al, 2019[34]	To explore the impact of nurse-led service among patients affected by renal cancer.	This nurse-led intervention included patients for follow-up appointments after either radical or partial nephrectomy surgery for histologically proven renal cell carcinomas at either 3, 6, or 12 monthly intervals, depending upon their stage, grade, and original diagnosis. The clinic is run by two clinical nurse specialists on a weekly basis and consists of an average of six patients per clinic, utilizing 30-min slots. No further details were reported about the nursing process of care.
Stanciu et al, 2018[39]	To evaluate a nurse-led model of personalized care after prostate cancer treatment.	This nurse-led intervention included the use of a comprehensive holistic needs assessment tool and care plan, specifically exploring the physical, emotional, spiritual, lifestyle, and family aspects of cancer survivorship, together with an additional bespoke instrument developed in secondary care to monitor physical symptoms. Following the assessment, the nurse will provide individualized information, advice, and support tailored to each patient to help men improve their symptoms or cope better with symptoms they cannot improve. Patient referrals to GP or secondary care and signposting to community or third-sector support services were made as appropriate.
Van der Meulen et al, 2013[45]	To develop a nurse-led educational intervention to provide information during a discharge interview and to investigate the effects of the intervention on information needs and satisfaction with information in head and neck cancer.	This nurse-led intervention provided educational intervention in a 30–45 min structured conversation about general information, wound care, physical-social problems, work, and finances.

ECOG, Eastern Cooperative Oncology Group; PFRC, Patient and Family Resource Center; QoL, quality of life; PROMs, Patient-reported outcome measures; PCNS, Prostate Cancer Nurse Specialist; PSA, Prostate Specific Antigen; DRE, Digital Rectal Examination; MDT, multidisciplinary team; PCNS, Prostate Cancer Nurse Specialist; SCNS, Supportive Care Needs Short; LUTS, Lower Urinary Tract Symptoms; MRI, magnetic resonance imaging.

Several possible reasons exist for a lack of nurse-led geriatric assessment among older people with cancer, which may include: a lack of funding and resources; reduced capacity to meet clinical demand; time; and poor communication processes for referrals.[48] Historically, these barriers have led to variation and poor documentation around the development and implementation of nurse-led interventions in cancer care.[49] The findings of this review reflect similar shortfalls in practice around the integration of geriatric assessment, with the exception of Festen et al.[31] who did include a geriatric oncology intervention. However, Festen et al.[30] reported that the reason for including geriatric assessment in their model was driven by the 'accumulating evidence' on the value of its predictive validity in determining clinical outcomes. While this may be true, four newer studies included in the review did not acknowledge this accumulating evidence and suggest an evidence-practice gap in the process of assessing and implementing appropriate care interventions and treatment for older people with cancer.

Addressing this evidence-practice gap is a priority for improving the assessment and treatment of older people living with cancer, as clinical assessments can influence different cancer treatment regimens for older patients diagnosed with cancer. Consideration of age and tumor characteristics alone is insufficient to determine fitness for treatment for people > 65 years. Comprehensive geriatric assessments may trigger the use of less aggressive or more aggressive treatments, which can affect quality of life, implications for supportive care, and overall survival.[31,50] Validated and practical geriatric assessment tools to assess function, falls, comorbidity, cognition, depression, and nutrition can be used to predict adverse outcomes in patients aged 65 years and older receiving treatment for cancer.[51] The use of validated geriatric assessment tools can assist with developing goal-directed interventions and guide management in older people with cancer.[52] The transfer of information between health professionals using standardized instruments enhances timely communication exchange and teamwork to accurately document decision-making and goals of care to optimize quality and quantity of life over time.

One approach to optimizing the physical and psychological health of older people with cancer is through the implementation of prehabilitation models of care for the older person with cancer. Prehabilitation is a model of cancer care implemented between the time of a cancer diagnosis and the beginning of acute treatment. A recent systematic review[53] in older men affected by prostate cancer identified that multi-component nurse-led prehabilitation interventions of supportive care may provide benefit in optimizing physical and psychological reserve before treatments and reduce treatment-related deconditioning. Prehabilitation includes physical and psychological assessments,[54] including comprehensive geriatric assessments, that establish baseline functioning and identify impairments that can impact cancer treatment-related morbidity, as well as targeted interventions to optimize overall well-being prior to treatment.

This systematic review highlighted the need for further research to explore the impact of nurse-led geriatric oncology interventions, which are safely embedded in the MDT. Despite the growing need for appropriate models of cancer care for older people[51] this review has identified a dearth of inclusion of geriatric assessment to identify age-related vulnerabilities such as functional, medical, cognitive, psychosocial, and nutritional needs in existing nurse-led interventions. Quantity of life vs. quality of life in older people with cancer must be carefully considered in cancer MDTs to ensure informed consent and shared treatment decision-making processes; however, these important considerations were seldom discussed in any of the studies included. A recent systematic review[55] identified that only a small percentage of patients diagnosed with cancer will ever be discussed in a cancer MDT meeting, which therefore further compounds the challenge of integrating timely and effective MDT geriatric oncology considerations into patient care. Importantly, this review has underscored the need for further research to test nurse-led interventions in geriatric oncology and future research directions in prehabilitation for older people with cancer.

Limitations

Despite this review following a clear, rigorous, and transparent review process, there are some important limitations to point out. This review included studies that were published in the English language only and, as such may have excluded publications in other languages that might have omitted important information. However, the review did represent evidence from a range of international countries. One of the major challenges of this review was synthesising evidence from heterogeneous study designs and methodologies, and our findings are constrained due to the methodological limitations of the primary studies included. This review has enabled a broad summary of the evidence in relation to nurse-led interventions for older people with cancer, which has provided some clinical practice insights and facilitated refinement of future research directions. We included studies where the mean age of the patient sample was $\geq$ 65 years. As a result, we identified studies with nurse-led interventions among people with a mean age of 65 years, not studies specifically designed for people $\geq$ 65 years. Therefore, the included studies underscore that existing nurse-led interventions include some older people which are largely not addressing or including comprehensive geriatric assessments, which remains a significant gap in practice and research.

Conclusions

The findings of this review highlight a concerning lack of evidence on integrating geriatric assessments into nurse-led interventions. With most developed countries reporting an aging population and a general trend of cancer survivors living longer following diagnosis, the need to incorporate geriatric assessments into routine care is a priority for optimizing the health of older people living with cancer. Since few approaches are reported in the literature, adopting innovative strategies such as the use of prehabilitation and involving cancer MDTs to facilitate geriatric assessment should be explored further.

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Elizabeth Alemania: Screening, data extraction, reviewing, writing, reviewing final draft. **Alicia Hind:** Screening, data extraction, reviewing. **Juliana Samara:** Reviewing, editing draft, writing, reviewing final draft. **Murray Turner:** Database search strategy design and execution, data extraction, writing, reviewing, editing. **Nick Ralph:** Writing, reviewing. **Catherine Paterson:** Conceptualization, methodology, validation, screening, data extraction, formal analysis, interpretation, writing and reviewing & editing, supervision. All authors had full access to all the data in the study, and the corresponding author had final responsibility for the decision to submit for publication. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Declaration of competing interest

The authors declare no conflict of interest.

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Ethics statement

Not required.

Data availability statement

Data availability is not applicable to this article as no new data were created or analyzed in this study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apjon.2023.100289.

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Supplementary Table 1. Exemplar of Database searches

Database	Date	Search Terms	Limiters	# Results
CINAHL	14/09/2021 UPDATED 20/09/2022	(((nurse-led OR nurse-managed) N3 (care OR model* OR program* OR intervention*)) AND (cancer* OR oncolog* OR neoplasm*))	Date: 1990- Language: English	292 49
Google Scholar	14/09/2021 UPDATED 20/09/2022	nurse-led nurse-managed care model program intervention cancer oncology neoplasm	Date 1990-	34 2
MEDLINE	14/09/2021 UPDATED 20/09/2022	(((nurse-led OR nurse-managed) N3 (care OR model* OR program* OR intervention*)) AND (cancer* OR oncolog* OR neoplasm*))	Date: 1990- Language: English	322 64
PsycINFO	14/09/2021 UPDATED 20/09/2022	(((nurse-led OR nurse-managed) N3 (care OR model* OR program* OR intervention*)) AND (cancer* OR oncolog* OR neoplasm*))	Date: 1990- Language: English	90 3
Scopus	14/09/2021 UPDATED 20/09/2022	(((nurse-led OR nurse-managed) W/3 (care OR model* OR program* OR intervention*)) AND (cancer* OR oncolog* OR neoplasm*))	Date: 1990- Language: English	328 60
Total:				1066 1244