



SCOPING REVIEW

Cancer Nursing Frameworks to Guide Clinical Capability, Education and Careers: A Scoping Review of the International Literature

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ABSTRACT

Aim: This review aimed to provide a current global profile of all existing cancer nursing competency, capability, education and career frameworks and map capabilities and competencies to the clinical, facilitation of education, management and research pillars of practice.

Design: Scoping review.

Data Sources: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library, Epistemonikos, Google Scholar, Medline, and PubMed. Gray literature searches and reference list searches were also performed.

Methods: This review was guided by Arksey and O'Malley's method and followed PRISMA guidelines for reporting. Screening and data extraction was conducted independently by two or more authors. The quality of frameworks were assessed using The Joanna Briggs Institute (JBI) critical appraisal checklist for textual evidence: policy/consensus guidelines. Data were analyzed and narratively synthesized by experienced cancer nurse researchers.

Results: Thirty-four articles were included, comprising of 29 cancer nursing frameworks. Frameworks were categorized as competency frameworks, career and education frameworks, education/learning pathways, and career/professional development frameworks. Competencies and capabilities described in the frameworks were mapped to the four pillars of practice including clinical ($n = 27$), facilitation of learning ($n = 20$), leadership and management ($n = 23$), and research and scholarship ($n = 24$).

Conclusions: Comprehensive cancer nursing frameworks are pivotal in enabling nurse leaders to grow and develop the cancer nursing workforce globally. They are also integral to support cancer nurses in providing high-quality, effective, and safe care for patients and their families across the cancer continuum.

Impact: This is the first review to comprehensively capture and synthesize the capabilities, educational components, and career pathways outlined in existing cancer nursing frameworks worldwide and highlights where areas of improvement are needed to support professional growth, job satisfaction and retention of cancer nurses.

1 | Background

Nursing practice has evolved, and its scope and roles of practice have exponentially expanded. Historically nursing and nurses were seen as holistic carers, in contrast to medicine's reductionist, biomedical model (World Health Organization 2020). In contemporary healthcare nurses deliver specialized care to diverse patient populations and/or conditions (World Health Organization 2020). In 1992, The International Council of Nurses (ICN) outlined the conditions necessary to advance nursing in specialist fields to strive for harmonization and consistency (Affara and Styles 1992). Prerequisites included adopting a systematic approach to designating nursing specialities, setting clear scopes of practice, establishing minimum standards for education and practice, maintaining competence, establishing regulatory mechanisms, and integrating nursing specialities into human health resources and planning (Affara and Styles 1992). However, the adoption and roll out of these recommendations have been inconsistent worldwide. Consequently, the concept of nursing specialities continues to lack transparency due to inconsistent definitions and pathways for career development both in the reported literature, and importantly in practice (World Health Organisation 2020a; Dury et al. 2014; Duffield et al. 2011; Dowling et al. 2024; Hill 2017). The challenge lies with the failure to reach international consensus on the degree of specialization required while simultaneously avoiding professional fragmentation and preserving holistic nursing practice. Several key factors necessitate the initiation of specialist practice, including (1) the changing demand for services, (2) response to shortage of medical professionals (3) growing healthcare costs, and (4) professional development opportunities within nursing as a profession (World Health Organisation 2020a, 2020b). It is clear from the evidence (Donald et al. 2013; Douglas et al. 2018; Gardner et al. 2016; Lowe et al. 2012; Pollard et al. 2010; Yates et al. 2020) that nurses who are specialists in their respective clinical fields add value to healthcare provision, optimize person centered care, improve patient satisfaction or experience and reduce service delivery costs. Nurses who demonstrate expertise in both clinical knowledge and practice are better equipped to draw upon evidence to inform practice which can better facilitate interprofessional collaboration (Salmond and Echevarria 2017).

Frameworks that guide clinical practice, education and career development are generally developed and/or endorsed by professional nursing organizations and or regulatory bodies (Batt, Tavares, and Williams 2020; Leung, Trevena, and Waters 2016). In this paper we define a framework as a document that describes cancer nursing roles, education and the competencies and/or capabilities that nurses must have to deliver safe cancer care. Although different, the terms competency and capability are often used interchangeably. Competencies can be described as the knowledge, skills and abilities required to perform tasks relevant to a particular context (Batt, Tavares, and Williams 2020). In contrast capabilities include the ability

to know how to learn and integrate previous knowledge, skills and experiences into new and familiar situations (Whitfield et al. 2024). With incongruence in the language used both between and within frameworks we have included both capabilities and competencies when describing clinical knowledge and skills. While there is no standard procedure for developing competency frameworks for healthcare professionals (Batt, Tavares, and Williams 2020) nor consensus on the role of capability vs. competency (O'Connell, Gardner, and Coyer 2014; Zumstein-Shaha and Grace 2023) these frameworks are none-the-less crucial. They help guide nursing practice by outlining core competencies and capabilities specific to their clinical context (Wit et al. 2023). The absence of national frameworks for nursing specialties has been identified as a barrier to recognizing, recruiting and retention of nurses in specialty areas and roles (Bradford et al. 2023; Evans 2023).

Cancer is the second leading cause of death globally, resulting in an estimated 9.6 million deaths annually (Sung et al. 2021). Cancer burden continues to grow with an estimated 50 million people affected by cancer globally (Sung et al. 2021). As both an acute and chronic condition, cancer represents a large group of diseases, each with its own treatment modality. These treatments often result in variable toxicities and side-effects and are experienced alongside profound unmet care needs (Paterson et al. 2023). Cancer nursing has emerged as a speciality to address the complex and multifaceted impacts of cancer on patients, their families, and healthcare systems globally. This specialization is necessary due to the physical, psychological, social and spiritual challenges associated with cancer care, (Paterson et al. 2023; Young et al. 2020). Cancer nurses make a clinically meaningful contribution to patient education, cancer prevention, screening, treatment, survivorship, palliative care, and research (Yates et al. 2020; Young et al. 2020). However, internationally, cancer nursing faces an imminent care crisis due to a shortage of nurses stemming from chronic recruitment and retention issues (World Health Organisation 2020a; Challinor 2023). It has been reported that a significant number of cancer nurses will leave the profession within the next 10 years, which will significantly impact patient safety and contribute further to missed nursing care (Bradford et al. 2023; Challinor 2023). The reasons for this shortfall in the cancer workforce are varied and complex, but one foundational "serious" omission has been the considerable variations in access to cancer nursing frameworks globally. Frameworks provide nurses with standardization, a clear structured pathway for career development and contribute to equitable access to education. Standardization is also of benefit to policy makers, hospital administrators, non-government officials and other relevant stakeholders. A recent review (Dowling et al. 2024) has highlighted the potential benefits for international agreement of cancer nursing roles to promote career pathway development. To respond to this call and these challenges, a contemporary evidence synthesis of all cancer nursing frameworks is required to address the current and future projected shortfalls in the cancer nursing workforce (World Health Organisation 2020a; Bradford et al. 2023; Challinor 2023).

1.1 | Aim

This scoping review aimed to provide an up-to-date comprehensive international profile of existing cancer nursing specialist frameworks, covering practice, education and career frameworks, and to map key capabilities and competencies across (1) clinical practice, (2) facilitation of learning, (3) leadership and management, and (4) research and scholarship.

2 | Methods

This scoping review was conducted using Arksey and O'Malley's framework (Arksey and O'Malley 2005), and according to a review protocol developed by authors. The scoping review methodological steps as defined by Arksey and O'Malley were applied to ensure a systematic and rigorous approach in developing the research questions, identifying relevant studies, selecting and excluding studies, extracting data, and reporting findings (Arksey and O'Malley 2005). The findings from the included studies are presented using the PRISMA—ScR extension as recommended by the Joanna Briggs Institute (JBI) (Tricco et al. 2018) (Data S1).

2.1 | Search Strategy

The search strategy was created with librarian assistance. The following search terms and Medical Subject Headings (MeSH) terms were used to identify studies: 'nursing,' 'nurses,' 'specialist,' 'specialty,' 'specialisation,' 'education,' 'educational,' 'competency,' 'competencies,' 'clinical,' 'career,' 'advance,' 'practice,' 'professional,' 'framework,' and 'guidance' (Data S2). By using Boolean operator, truncation, the search terms were applied to databases including CINAHL, MEDLINE (via Ovid), PubMed, Cochrane Library, Epistemonikos and Google Scholar. Searches were conducted in October 2023. Grey literature was obtained from professional nursing organizations' websites and frameworks that emerged through Google searches. Key cancer nursing informants were also emailed to identify any framework documents missed by the search or in development. Additionally, a search of reference lists of selected studies and frameworks was conducted to identify other relevant studies or documents to ensure all existing nursing frameworks were represented in this evidence synthesis research.

2.2 | Eligibility Criteria

The inclusion criteria for cancer nursing frameworks included in this review were as follows:

- Population: Cancer nursing frameworks written and endorsed by international, national, and state-based nursing organizations or government agencies
- Concept: Documents that may be described as a framework, strategy, model, standard or guideline for cancer nursing, and provide international, national, or state guidance about nursing education, competency and/or

career pathways in cancer nursing. The authors describe the method by which the framework was developed. There is no evidence of a more recent updated version of the framework.

- Context: Cancer nursing

Sources published in English from 2009 to the present day (May 2024) were included to coincide with the year that the first review and second edition of Cancer Nursing Educational Framework (EdCan) (Aranda and Yates 2009) was published. The EdCaN Framework is a foundational framework which has informed the development of many other global cancer nursing frameworks. Frameworks excluded from this review were (a) written by organizations that are not concerned with cancer nursing; (b) do not have an international, national, or state focus or jurisdiction (e.g., local health districts or single institutions); (c) do not provide guidance about nursing education, competency and/or career pathways; (d) frameworks for specific clinical skills or from other specialties (not specific to cancer); (e) published in a language other than English before 2009; and (f) older version of a document which had already been included.

2.3 | Article Selection

Relevant articles retrieved from database records were transferred to Covidence software where the duplicate articles were removed. Two or more authors independently performed title and abstract screening (CT and JC) and full text screening (MR, RM, DT, CT and JC). Discrepancies that occurred between reviewers were resolved by consensus or by a third author (GM). Grey literature was searched by two authors (CT and JC) and sources were assessed against the selection criteria by one author and quality checked by a second author. The full text of each potentially relevant articles was also rescreened by another author (GM). Discrepancies that occurred between reviewers were resolved by consensus.

2.4 | Data Extraction

Data were extracted in Microsoft Word using a data extraction table developed by the research team. The data extraction table was pilot tested on several frameworks first and refined. The process of data extraction was undertaken by (RM, MR, DT, LA, ES, ND) and cross-checked for accuracy and consistency by (JC, CT) (Data S3). Discrepancies were resolved through discussion until consensus was reached. Where there was missing information, the authors contacted the corresponding authors or organizations of the relevant articles or frameworks for more information to ensure a comprehensive mapping of all frameworks.

2.5 | Quality Assessment of Frameworks

The quality of all frameworks was assessed using The Joanna Briggs Institute (JBI) critical appraisal checklist for textual evidence of policy/consensus guidelines (McArthur

et al. 2015). Total scores were applied to identify the quality of frameworks. A “Yes” response on the checklist was given a score of 1 and colour coded green, indicating that the framework met the critical criteria. A score of 0 and a red colour was assigned to “No” responses. The answers “Unclear”, and “Not applicable” are also given a score of 0 and colour coded orange. The total scores ranged from 0 (0%) to 7 (100%). Higher scores represent higher quality. Thirteen frameworks (Canadian Association of Nurses in Oncology 2019; Children’s Cancer and Leukaemia Group 2022; Children’s Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014) were rated at the highest quality with total scores of 6/7 (86%). Five frameworks (Cancer Institute of NSW 2018; Day et al. 2014; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020) scored 0 (0%) as they did not meet any of the critical criteria. Outcomes are shown in Table 1.

2.6 | Data Analysis and Synthesis

Findings were synthesized via narrative analysis (Sukhera 2022) by experienced cancer nurse researchers (CT, JC, GM, CP). Four main elements of narrative synthesis (Popay et al. 2006) were used to guide the analysis. First, we developed an understanding of how and for whom the frameworks worked. We then performed a preliminary synthesis by identifying common words and themes across the included documents and explored relationships between terms describing various clinical capabilities and/or competencies (as stated in the source documents), education pathways and career pathways. Processes were iterative and continuously checked by the team for robustness (Popay et al. 2006). Although recognizing that capabilities and competencies are, by definition, not the same, for the purpose of this study they were coded and categorized together due to the interchangeable use of the terms across frameworks. Coding and categorizing of all data were performed manually by JC and CT initially and in consultation with GM and CP. The clinical competency and/or capability component of the frameworks were coded, categorized and synthesized deductively against the four pillars of practice (clinical practice, facilitation of learning, leadership and management, and research and scholarship) (Gloster and Leigh 2021). The four pillars of practice were used as a framework to better understand the broad scope of practice that is required of all cancer nurses. Education pathways (pathways that assist practitioners and educators to develop appropriate knowledge, skills, and evidence capabilities in cancer care) and career pathways (pathways that facilitate the development and provide career structure for cancer nurses) were coded, categorized, and themed inductively, through identifying common words and themes but also allowing the data to be representative of itself. After the initial extraction authors reviewed all the data and further extracted, analysed, and narratively synthesized information through another careful iterative process to ensure full capture of the underlying

conceptual frameworks, theory, and methodology that guided the development of the frameworks.

3 | Results

3.1 | Characteristics of Included Sources

Of the 2081 articles screened, a total of 34 sources were included in this review which represented a total of 29 cancer nursing frameworks that encompassed capability/competency frameworks, learning pathways, career pathways or a combination of all three as represented in the PRISMA flow diagram (Figure 1). Studies excluded at full-text and reason for exclusion are listed in Data S4 and S5.

Twenty-eight frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children’s Cancer and Leukaemia Group 2022; Children’s Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) were published through official cancer nursing organizations’ websites and one was described in a peer-reviewed paper (Day et al. 2014). Four other included sources consisted of editorials, commentaries or abstracts outlining components or development of an included framework (Evans 2023; Afseth 2021; Esplen et al. 2018; Nowell and Campbell 2020). Most frameworks were from the United Kingdom (UK) ($n=12$) (Children’s Cancer and Leukaemia Group 2022; Children’s Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Adams and Jones 2018), followed by the United States of America (USA) ($n=5$) (Day et al. 2014; Oncology Nurses Society 2010, 2016, 2017, 2019), Australia ($n=4$) (Aranda and Yates 2009; Jakimowicz et al. 2023; Cancer Institute of NSW 2018; VCCC Alliance 2022), Canada ($n=2$) (Canadian Association of Nurses in Oncology 2019, 2018; De Souza Institute 2021) and Europe (European Oncology Nursing Society, 2022), Hong Kong (Hong Kong Academy of Nursing 2020), Republic of Ireland (National Cancer Control Programme 2012), New Zealand (New Zealand Nurses Organisation Cancer Group 2014), South Africa (South African Nursing Council 2020) ($n=1$) (see Figure 2). This figure underscores the gap in career development pathways/frameworks for cancer nurses in low- to middle- income countries.

A summary of the included documents which reported on the 29 oncology nursing frameworks is provided in Table 2.

TABLE 1 | The quality assessment of Cancer Nursing Frameworks.

Authors/organizations	Frameworks (n = 29)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total n = yes
Aranda and Yates (2009)	EdCan: A National Professional Development Framework for Cancer Nursing	1	1	1	1	1	0	1	6/7
Canadian Association of Nurses in Oncology (2019)	CANO/ACIO Nursing Knowledge and Practice Framework for Cancer Care	1	1	1	1	1	0	1	6/7
Canadian Association of Nurses in Oncology (2018)	Learning Pathway for the Specialized Oncology Nurse	1	1	0	0	0	0	0	2/7
Cancer Institute of NSW (2018)	Radiation Oncology Nursing Knowledge and Skills Framework	0	0	0	0	0	0	0	0/7
Children's Cancer and Leukaemia Group (CCLG) (2023)	Career and Education for specialist nurses working in the field of long-term follow-up and late effects for children and young people after cancer V2.0	1	1	1	1	1	0	1	6/7
Children's Cancer and Leukaemia Group (2022)	Career and Education Framework for Children and Young People (CYP) Cancer Nursing V3.0	1	1	1	1	1	0	1	6/7
Spencer and Woodman (2020) On behalf of CCLG	Advanced Clinical Practitioner Paediatric Oncology & Haematology Capability Document	1	1	1	1	1	0	1	6/7
de Souza Institute (2021)	Learning Pathway for Nurses New to Oncology	0	0	0	0	0	0	0	0/7
European Oncology Nursing Society (2022)	The EONS Cancer Nursing Education Framework	1	1	1	1	1	0	1	6/7
Hong Kong Academy of Nursing (2020)	Nursing Council of Hong Kong Core Competencies of an Advanced Practice Nurse for Oncology Nursing	0	0	0	0	0	0	0	0/7
Lung Cancer Nursing United Kingdom (UK) (2021)	Crucial Complex, Caring: A Professional Development Framework for Lung Cancer Nurse Specialists	1	1	1	0	1	0	1	5/7
Macmillan Cancer Support (2020)	The Macmillan Competency Framework for Nurses (MCFN)	1	1	1	1	1	0	1	6/7
National Cancer Control Programme (2012)	A Strategy and Educational Framework for Nurses Caring for People with Cancer in Ireland	1	1	1	1	1	0	1	6/7

(Continues)

TABLE 1 | (Continued)

Authors/organizations	Frameworks (n = 29)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total n = yes
National Health Service and Health Education England (2022)	Career Pathway, Core Cancer Capabilities and Education Framework ACCEND program	1	1	1	1	1	0	1	6/7
Jervis et al. (2021)	Neuroendocrine Cancer: A Nurse Competency Framework	1	1	1	0	1	0	1	5/7
On behalf of Neuroendocrine Cancer UK	Building of Knowledge and Skills for Cancer Nurses	1	1	1	0	1	0	1	5/7
New Zealand Nurses Organisation Cancer Group (2014)	Oncology Clinical Trials Nurse Competencies	1	1	1	0	1	0	1	5/7
Oncology Nurses Society (2010)	Oncology Nurse Generalist Competencies	1	1	1	0	1	0	1	5/7
Oncology Nurses Society (2016)	2017 Oncology Nurse Navigator Core Competencies	1	1	1	0	1	0	1	5/7
Oncology Nurses Society (2017)	Oncology Nurse Practitioner Competencies	1	1	1	0	1	0	1	5/7
Oncology Nurses Society (2019)	The Oncology Nursing Society Leadership Competency Project: Developing a road map to professional excellence	1	1	0	0	1	0	1	4/7
Day et al. (2014)	A framework for continuing professional development for nurses working with children and adolescents with cancer	1	1	1	1	1	0	1	6/7
Paediatric Integrated Cancer Service (2023)	Prostate cancer specialist nurse practice and capability framework	1	1	1	1	1	0	1	6/7
Jakimowicz et al. (2023) On behalf of the Prostate Cancer Foundation of Australia	Career Pathway and Education Framework for Cancer Nursing	1	1	1	1	1	0	1	6/7
Royal College of Nursing (2022)	A Competency Framework for Nurses Providing Care to People with Breast Cancer	1	1	1	1	1	0	1	6/7
Royal College of Nursing (2019)	Developing a Cancer CNS Capabilities Framework in the Northwest—Draft	1	1	1	1	1	0	1	6/7
Skills for Health (2021)	Competencies for oncology and palliative nursing	0	0	0	0	0	0	0	0/7
South African Nursing Council (2020)	Caring for teenagers and young adults with cancer: A competence and career framework for nursing	1	1	1	1	1	0	1	6/7
Smith et al. (2014)									
On behalf of the Teenage Cancer Trust									

(Continues)

TABLE 1 | (Continued)

Authors/organizations	Framework(s) (n = 29)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total n = yes
Adams and Jones (2018) On behalf of the United Kingdom Oncology Nursing Society	Acute Oncology Knowledge and Skills Guidance	1	1	1	1	0	0	1	5/7

Note: Q1. Are the developers of the policy/ consensus guideline (and any allegiances/affiliations) clearly identified? Q2. Do the developers of the policy/ consensus guideline have standing in the field of expertise? Q3. Are appropriate stakeholders involved in developing the policy/guideline and do the conclusions drawn represent the views of their intended users? Q4. Are biases due to competing interests acknowledged and responded to? Q5. Are the processes of gathering and summarizing the evidence described? Q6. Is any incongruence with the extant literature/evidence logically defended? Q7. Are the methods used to develop recommendations described?

The methodology used to develop frameworks was described in 24 sources (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Smith et al. 2014; Day et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018; Afseth 2021; Nowell and Campbell 2020; Gaguski et al. 2017) either in the main framework document (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Smith et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010; Oncology Nurses Society 2016; Oncology Nurses Society 2017; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) or through a peer reviewed publication or conference abstract about the framework development (Day et al. 2014; Afseth 2021; Nowell and Campbell 2020; Gaguski et al. 2017). Evidence, policy, or literature reviews were described as foundation work in framework development in 16 sources (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Smith et al. 2014; Day et al. 2014; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2010, 2016, 2017, 2019; Afseth 2021; Gaguski et al. 2017). Although the ONS framework (Oncology Nurses Society 2010, 2016, 2017, 2019; Gaguski et al. 2017) and EONS framework (European Oncology Nursing Society, 2022) reported this as a systematic process no publications of literature reviews were found in our extensive searches. Most (69%) frameworks reported using consultation processes for development. These included broad multilayered consultations involving both clinicians (nurses and non-nurses) and consumers (Canadian Association of Nurses in Oncology 2019; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Smith et al. 2014; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016; Adams and Jones 2018; Afseth 2021) as well as cancer nursing consultations that incorporated, peer and expert opinions (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Jakimowicz et al. 2023; Jervis et al. 2021; Oncology Nurses Society 2017, 2019). However, experts were not defined in any of the sources or frameworks. Nine frameworks (European Oncology Nursing Society, 2022;

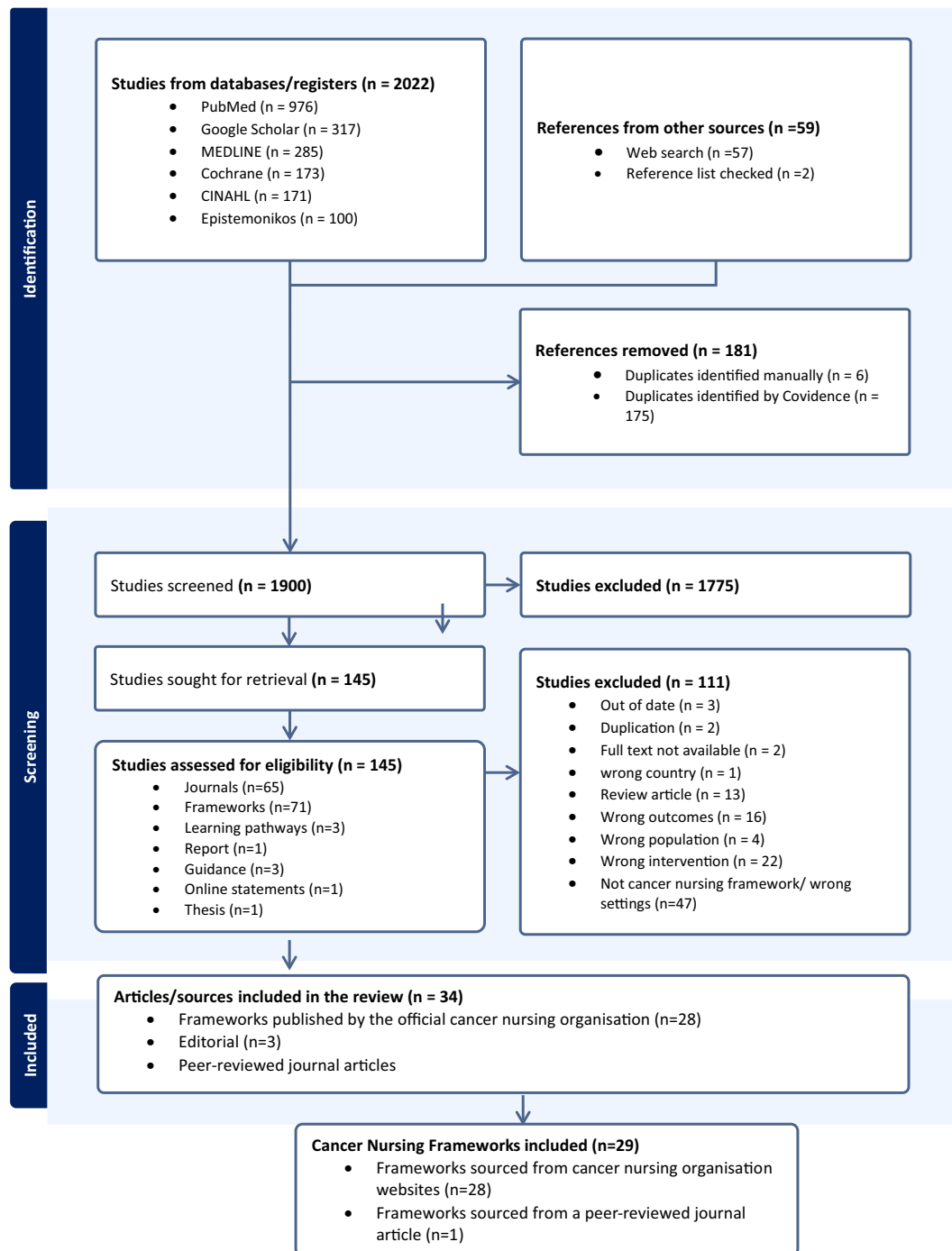


FIGURE 1 | PRISMA flow diagram.

Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Smith et al. 2014; Oncology Nurses Society 2016; Oncology Nurses Society 2019) described academic methods such as cross-sectional surveys, semi-structured interviews with qualitative analysis techniques or Delphi methods for framework content consensus. The suite of Oncology Nurses Society (ONS) frameworks (Oncology Nurses Society 2010, 2016, 2017, 2019) all used the same processes, which are organizational policy for nurses wanting to develop frameworks. These processes included (1) extensive literature

review, (2) development of competency statements, (3) field and expert review of draft statements (4) implementation (Oncology Nurses Society 2010, 2016, 2017, 2019).

3.2 | Cancer Nursing Frameworks

All 29 cancer nursing frameworks (Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023;

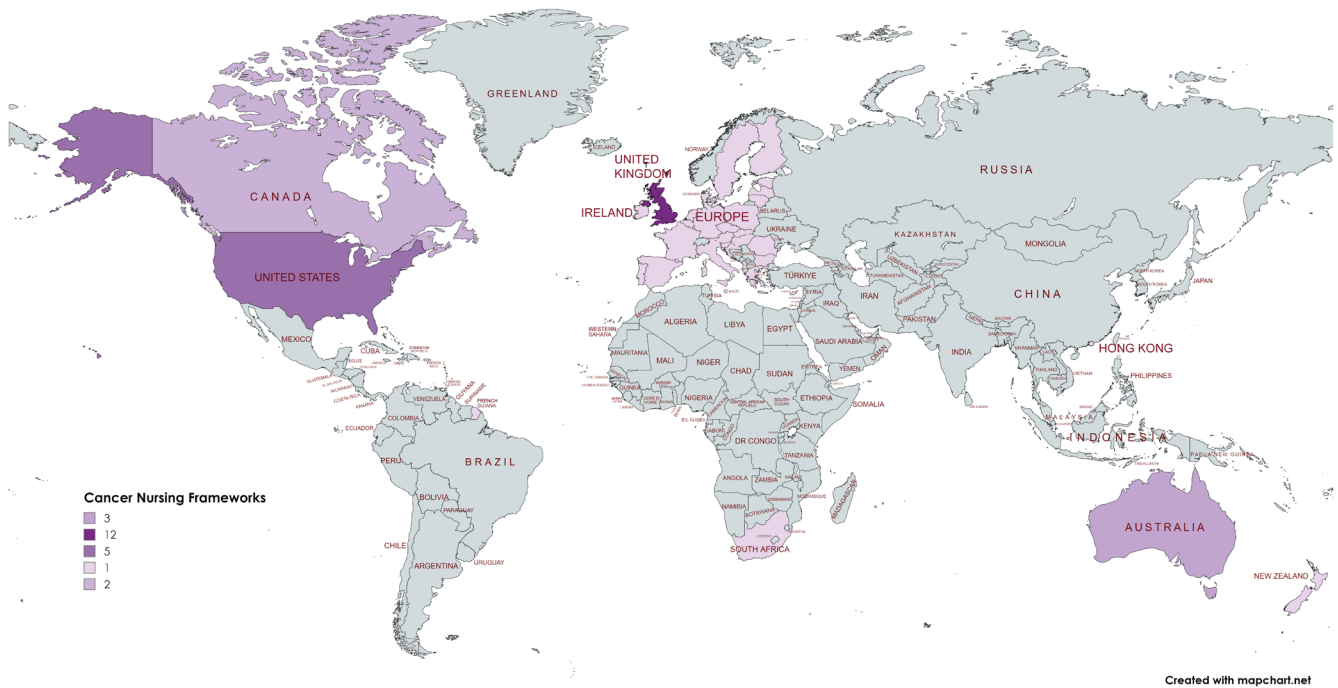


FIGURE 2 | Cancer nursing frameworks global distribution.

European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Cancer Institute of NSW 2018; Day et al. 2014; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) outlined practice competencies or capabilities which encompassed the knowledge and skills that cancer nurses required to deliver safe cancer care. The clinical competency component of the frameworks was coded and categorized against the four pillars of practice (Gloster and Leigh 2021). These pillars included clinical practice ($n=28$) (knowledge, skills and behaviors needed to provide high-quality person-centered care), facilitation of learning ($n=20$) (knowledge, skills and behaviors needed to enable effective development of self and others), leadership ($n=23$) (knowledge, skills and behaviors needed to lead, influence and motivate others to work effectively and efficiently), and research and scholarship ($n=24$) (knowledge, skills and behaviors needed to debate and inform evidence-based practice) (Gloster and Leigh 2021). Fifteen of the included frameworks described practice competencies and capabilities that develop over time according to practice location, level of experience, or role (Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019, 2022; Spencer and Woodman 2020; Smith et al. 2014; Lung Cancer Nursing

United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018; Esplen et al. 2018). The Canadian knowledge and practice Framework (Canadian Association of Nurses in Oncology 2019), New Zealand Knowledge and skills framework (New Zealand Nurses Organisation Cancer Group 2014) and the Victorian Paediatric Integrated Cancer Services (Paediatric Integrated Cancer Service 2023) used the EdCan framework (Aranda and Yates 2009) in varying degrees in the development of their competency development. Benner's (Benner 1982) novice to expert model was used or adapted to guide seven included frameworks, mainly adopted in the UK frameworks and one in Australia (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Spencer and Woodman 2020; Smith et al. 2014; Oncology Nurses Society 2016; Paediatric Integrated Cancer Service 2023; Esplen et al. 2018). Only eight frameworks focused on competencies or capabilities for advanced practice cancer nurses (Jakimowicz et al. 2023; Skills for Health 2021; Day et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019).

3.3 | Practice Competencies and Capabilities

3.3.1 | Clinical

Twenty-eight of the cancer nursing frameworks (Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control

TABLE 2 | Characteristics of included sources.

Characteristics of included frameworks		N	Sources
Total number of frameworks (sources)		29 (34)	
Source type	Peer-reviewed publications/ supporting documents	5	Afseth (2021); Day et al. (2014); Esplen et al. (2018); Evans (2023); Nowell & Campbell (2020)
	Organizational framework documents	28	Adams & Jones (2018); Aranda & Yates (2009); Canadian Association of Nurses in Oncology (2018, 2019); Cancer Institute of NSW (2018); Children's Cancer and Leukaemia Group (2022); Children's Cancer and Leukaemia Group & Teenagers and Young Adults with Cancer (2023); De Souza Institute (2021); European Oncology Nursing Society (2022); Hong Kong Academy of Nursing (2020); Jakimowicz et al. (2023); Jervis et al. (2021); Lung Cancer Nursing United Kingdom (2021); Macmillan Cancer Support (2020); National Cancer Control Programme (2012); National Health Service (2022); New Zealand Nurses Organisation Cancer Group (2014); Oncology Nurses Society (2010, 2016, 2017, 2019); Paediatric Integrated Cancer Service (2023); Royal College of Nursing (2019); Skills for Health (2021); Smith et al. (2014); South African Nursing Council (2020); Spencer & Woodman (2020)
Country/region of focus	UK	12 (13)	Adams & Jones (2018); Afseth (2021); Children's Cancer and Leukaemia Group (2022); Children's Cancer and Leukaemia Group & Teenagers and Young Adults with Cancer (2023); Evans (2023); Jervis et al. (2021); Macmillan Cancer Support (2020); National Health Service (2022); Royal College of Nursing (2019); Skills for Health (2021); Smith et al. (2014); Spencer & Woodman (2020)
	United States of America	5 (6)	Day et al. (2014); Gaguski et al. (2017); Oncology Nurses Society (2010, 2016, 2017, 2019)
	Australia	4	Aranda & Yates (2009); Cancer Institute of NSW (2018); Jakimowicz et al. (2023); Paediatric Integrated Cancer Service (2023)
	Canada	3 (5)	Canadian Association of Nurses in Oncology (2018, 2019); De Souza Institute (2021); Esplen et al. (2018); Nowell & Campbell (2020)
	Europe	1	European Oncology Nursing Society (2022)
	Hong Kong	1	Hong Kong Academy of Nursing (2020)
	Ireland	1	National Cancer Control Programme (2012)
	New Zealand	1	New Zealand Nurses Organisation Cancer Group (2014)
	South Africa	1	South African Nursing Council (2020)

(Continues)

TABLE 2 | (Continued)

Characteristics of included frameworks		N	Sources	
Clinical/cancer setting	All cancer settings	16 (20)	Adams & Jones (2018); Canadian Association of Nurses in Oncology (2018, 2019); Day et al. (2014); De Souza Institute (2021); Esplen et al. (2018); European Oncology Nursing Society (2022); Evans (2023); Gaguski et al. (2017); Hong Kong Academy of Nursing (2020); Macmillan Cancer Support (2020); National Cancer Control Programme (2012); National Health Service (2022); New Zealand Nurses Organisation Cancer Group (2014); Nowell & Campbell (2020); Oncology Nurses Society (2010, 2016, 2017); Royal College of Nursing (2022); South African Nursing Council (2020)	
	Radiation oncology unit	1	Cancer Institute of NSW (2018)	
	Oncology pediatric and adolescent and young adult	4	Children's Cancer and Leukaemia Group (2022); Children's Cancer and Leukaemia Group & Teenagers and Young Adults with Cancer (2023); Paediatric Integrated Cancer Service (2023); Smith et al. (2014); Spencer & Woodman (2020)	
	Lung cancer	1	Lung Cancer Nursing United Kingdom (2021)	
	Neuroendocrine cancer	1	Jervis et al. (2021)	
	Prostate cancer	1	Jakimowicz et al. (2023)	
	Breast cancer	1 (2)	Afseth (2021); Royal College of Nursing (2019)	
	Nursing population	Any cancer nurses	12 (16)	Adams & Jones (2018); Aranda & Yates (2009); Canadian Association of Nurses in Oncology (2018, 2019); Day et al. (2014); De Souza Institute (2021); Esplen et al. (2018); European Oncology Nursing Society (2022); Evans (2023); Gaguski et al. (2017); Macmillan Cancer Support (2020); National Cancer Control Programme (2012); National Health Service (2022); Nowell & Campbell (2020); Oncology Nurses Society (2016); Royal College of Nursing (2022)
		Radiation oncology nurses only	1	Cancer Institute of NSW (2018)
		Specialist cancer nurse working with children or adolescents only	5	Children's Cancer and Leukaemia Group (2022); Children's Cancer and Leukaemia Group & Teenagers and Young Adults with Cancer (2023); Paediatric Integrated Cancer Service (2023); Smith et al. (2014); Spencer & Woodman (2020)
Advanced practice/specialist cancer nurses		6 (7)	Afseth (2021); Hong Kong Academy of Nursing (2020); Jakimowicz et al. (2023); Jervis et al. (2021); Lung Cancer Nursing United Kingdom (2021); Royal College of Nursing (2019); Spencer & Woodman (2020)	
Nurse practitioners		1	Oncology Nurses Society (2019)	
Clinical trials nurses		1	Oncology Nurses Society (2010)	
Nurse navigators		1	Oncology Nurses Society (2017)	

(Continues)

TABLE 2 | (Continued)

Characteristics of included frameworks		N	Sources
Stated purpose of the framework	Competency framework	17 (20)	Adams & Jones (2018); Afseth (2021); Canadian Association of Nurses in Oncology (2019); Cancer Institute of NSW (2018); Day et al. (2014); Gaguski et al. (2017); Hong Kong Academy of Nursing (2020); Jakimowicz et al. (2023); Jervis et al. (2021); Macmillan Cancer Support (2020); New Zealand Nurses Organisation Cancer Group (2014); Nowell & Campbell (2020); Oncology Nurses Society (2010, 2016, 2017, 2019); Royal College of Nursing (2019); Skills for Health (2021); South African Nursing Council (2020); Spencer & Woodman (2020)
	Combination of career and education frameworks	6 (7)	Children's Cancer and Leukaemia Group (2022); Children's Cancer and Leukaemia Group & Teenagers and Young Adults with Cancer (2023); Evans (2023); National Cancer Control Programme (2012); National Health Service (2022); Royal College of Nursing (2022); Smith et al. (2014)
	Education/learning pathway	3 (4)	Canadian Association of Nurses in Oncology (2018); De Souza Institute (2021); Esplen et al. (2018); European Oncology Nursing Society (2022)
	Career/professional development framework	3	Aranda & Yates (2009); Lung Cancer Nursing United Kingdom (2021); Paediatric Integrated Cancer Service (2023)

Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) outlined clinical competencies or capabilities to ensure that nurses have the sufficient knowledge, skills, and attitudes required for the provision of high-quality, effective, and safe patient-centered cancer care. Although these were to varying degrees of depth. The original ONS leadership framework was the only one not to include clinically focused competencies (Day et al. 2014). Clinical competencies and capabilities developed in complexity with roles and experience and included fundamental nursing knowledge and skills, cancer specific knowledge and skills and advanced practice knowledge and skills.

Fundamental nursing skills formed the basis of many clinical competencies and capabilities throughout most of the frameworks ($n=27$), including; conducting a health assessment (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; Royal College of Nursing 2019; Skills for Health 2021; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United

Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Adams and Jones 2018), communicating effectively through active listening, speaking skills and documentation (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019, 2022; Skills for Health 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2017, 2019; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) and building supportive and therapeutic relationships (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; National Cancer Control Programme 2012; Jakimowicz et al. 2023; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014). Professional skills such as developing decision-making, critical thinking and advocacy skills (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; National Cancer Control Programme 2012; National Health Service 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2019), demonstrating the ability to deliver professional, legal, and ethical nursing practice (Aranda and Yates 2009; National Cancer

Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019; Skills for Health 2021; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2019; Paediatric Integrated Cancer Service 2023; Canadian Association of Nurses in Oncology 2018) and practicing culturally congruent care (Aranda and Yates 2009; Smith et al. 2014; Oncology Nurses Society 2019) were also detailed. Only three frameworks (Aranda and Yates 2009; Hong Kong Academy of Nursing 2020; Oncology Nurses Society 2010) explicitly identified skills in relation to the adoption of health technology in clinical competencies.

Specific cancer clinical competencies and capabilities involved more specialized knowledge and skills required to safely care for people with cancer and their carers. Twelve frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2022; Smith et al. 2014; Oncology Nurses Society 2016, 2017; Canadian Association of Nurses in Oncology 2018) noted that nurses required capabilities to care for people across the cancer trajectory. Various frameworks described capabilities to care for patients through particular phases of care including prehabilitation/rehabilitation (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Health Service 2022; Royal College of Nursing 2022; Paediatric Integrated Cancer Service 2023; Canadian Association of Nurses in Oncology 2018), survivorship (Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; European Oncology Nursing Society, 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Smith et al. 2014; De Souza Institute 2021; Oncology Nurses Society 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023) and palliative and end-of-life care (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Health Service 2022; Royal College of Nursing 2022; Paediatric Integrated Cancer Service 2023; Canadian Association of Nurses in Oncology 2018). The most common competencies focused on knowledge of cancer, clinical management of patients and patient education. Twenty frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019; Royal College of Nursing 2022; Smith et al. 2014; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) reported that nurses should be required to demonstrate an understanding of

cancer prevalence, epidemiology, pathophysiology, investigations, and treatment pathways.

Unsurprisingly, 27 frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Spencer and Woodman 2020; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) specifically required nurses to demonstrate the ability to manage cancer patient's treatments, symptoms and oncological emergencies. Other supportive care capabilities included the ability to provide psychological and psychosocial care to patients ($n=20$ frameworks) (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Cancer Institute of NSW 2018; De Souza Institute 2021; South African Nursing Council 2020; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016, 2019; Paediatric Integrated Cancer Service 2023), and follow-up support service provision in 18 frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Spencer and Woodman 2020; Smith et al. 2014; Cancer Institute of NSW 2018; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2017, 2019). Furthermore 20 frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Skills for Health 2021; Cancer Institute of NSW 2018; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2017, 2019; Adams and Jones 2018) described skills in providing patient education across the cancer trajectory including; screening, diagnosis, treatment, health promotion, support services and self-management. Other skills included; developing and implementing individualized treatment and care planning (Aranda and Yates 2009; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Spencer and Woodman 2020; Hong Kong Academy of Nursing 2020; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Canadian Association of Nurses in Oncology 2018), navigation and coordination (Aranda and Yates 2009; Canadian

Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2017; Adams and Jones 2018) and an understanding of occupational safety in relation to treatment and patient care (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Royal College of Nursing 2022; Paediatric Integrated Cancer Service 2023).

Clinical competencies focused on advanced practice roles were described in seven frameworks. These competencies and capabilities included; developing the ability to work autonomously (Aranda and Yates 2009; National Cancer Control Programme 2012; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019), caseload management and supportive care (Aranda and Yates 2009; National Cancer Control Programme 2012; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2019), independently prescribing cancer pharmacotherapy (within scope of practice) (Aranda and Yates 2009; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2022; Jervis et al. 2021; Oncology Nurses Society 2019), ordering appropriate investigations (within scope of practice) (Aranda and Yates 2009; National Cancer Control Programme 2012; Oncology Nurses Society 2019), interpretation of investigations (Aranda and Yates 2009; National Health Service 2022; Lung Cancer Nursing United Kingdom 2021) and provision of appropriate referrals (Aranda and Yates 2009; Oncology Nurses Society 2019).

3.3.2 | Facilitation of Learning

Although the development of knowledge to provide safe clinical care was implicit in all frameworks, documented professional development skills were articulated in 20 of the 29 included frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Smith et al. 2014; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018). Individual professional development and the expectation around development of others progressed in relation to experience and role.

Education related competencies for nurses at any level included the ability to identify own learning needs and advocate for educational opportunities (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; National Health Service 2022; Jakimowicz et al. 2023; Smith et al. 2014; South African Nursing Council 2020; New

Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016; Paediatric Integrated Cancer Service 2023), and to demonstrate commitment to continuing competence or development (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Skills for Health 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2017, 2019; Paediatric Integrated Cancer Service 2023).

Throughout the frameworks more experienced or advanced cancer nurses were required to understand and advise workforce learning needs (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Health Service 2022; Smith et al. 2014; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014), and facilitate and lead educational opportunities for both nurses and multidisciplinary staff (Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016, 2019; Adams and Jones 2018). Nurses in specialist or advanced roles were also expected to demonstrate capabilities in developing or contributing to education programs locally, nationally, and internationally and through tertiary providers in eight frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Cancer Control Programme 2012; National Health Service 2022; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Adams and Jones 2018).

3.3.3 | Leadership/Management

Twenty-three frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Smith et al. 2014; Day et al. 2014; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2016, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) reported various leadership skills that all nurses

should demonstrate to support capacity building. These skills include mentoring (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; National Cancer Control Programme 2012; Jakimowicz et al. 2023; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023), role modelling (Aranda and Yates 2009; National Cancer Control Programme 2012; Royal College of Nursing 2022; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020), clinical supervision or reflective practice (National Cancer Control Programme 2012; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014), communication and conflict resolution (Skills for Health 2021; Day et al. 2014), delegation (National Cancer Control Programme 2012; Smith et al. 2014), time and team management (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2022; Skills for Health 2021; Oncology Nurses Society 2010; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) and risk management (European Oncology Nursing Society, 2022; Royal College of Nursing 2022). In relation to service management, frameworks identified different expectations which included; having an understanding of the quality and safety requirements for accreditation (Oncology Nurses Society 2016), awareness of policy and procedures (Aranda and Yates 2009; National Health Service 2022; Royal College of Nursing 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) and understanding the fiscal requirements of clinical areas (Aranda and Yates 2009; Royal College of Nursing 2022; Oncology Nurses Society 2016, 2019). Five frameworks also highlighted that nurses at all levels should contribute to operational strategic service development (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Health Service 2022; Lung Cancer Nursing United Kingdom 2021). Importantly nurses at any level should understand the risks and stressors involved in caring for people with cancer and their families (Canadian Association of Nurses in Oncology 2019; Royal College of Nursing 2022; New Zealand Nurses Organisation Cancer Group 2014) and building a positive culture (Royal College of Nursing 2022; Smith et al. 2014; South African Nursing Council 2020).

Leadership capabilities expected of more experienced and advanced practice nurses, in addition to the abovementioned skills, were identified in 21 frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Smith et al. 2014; Day et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014;

Oncology Nurses Society 2017, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018). From an intra-personal perspective these included being innovative (Lung Cancer Nursing United Kingdom 2021), transformational (Day et al. 2014; Oncology Nurses Society 2019) and possessing clinical governance and leadership skills (Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2019; Day et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014). From a strategic perspective 15 frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2022; Skills for Health 2021; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2017; Oncology Nurses Society 2019; Adams and Jones 2018) identified that advanced cancer nurses should have capabilities to inform and shape service development, evaluation, and reform, enabling them to effectively respond to changing service and patient needs. Thirteen frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2022; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) stated that nurses who are in more senior roles should influence and lead policy formulation and reform.

Professional leadership capabilities were identified in 11 frameworks (Aranda and Yates 2009; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019; Smith et al. 2014; Hong Kong Academy of Nursing 2020; New Zealand Nurses Organisation Cancer Group 2014; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018). These capabilities included; promotion of nursing and professional organizations (Aranda and Yates 2009; National Cancer Control Programme 2012; Royal College of Nursing 2019; Smith et al. 2014; Hong Kong Academy of Nursing 2020; New Zealand Nurses Organisation Cancer Group 2014), being active members of hospital and wider national and international committees or organizations (Aranda and Yates 2009; National Cancer Control Programme 2012; National Health Service 2022; Hong Kong Academy of Nursing 2020; New Zealand Nurses Organisation Cancer Group 2014; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) and building partnerships to promote engagement with service provision, development and care coordination (Aranda and Yates 2009; Macmillan Cancer Support 2020; National Health Service 2022; Jakimowicz et al. 2023; Smith et al. 2014).

Finally, 11 frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer

and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2022; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Paediatric Integrated Cancer Service 2023) discussed nurses' leadership within the interdisciplinary team. Frameworks identified that cancer nurses' roles within the interdisciplinary team developed as they become more specialized. Leadership capabilities for early career nurses in relation to interdisciplinary collaboration included, creating practices and strategies with teams, and providing nursing support within the team (Canadian Association of Nurses in Oncology 2019; Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2022; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Paediatric Integrated Cancer Service 2023). Whereas more experienced or advanced practice nurses should be able to lead interdisciplinary teams through providing mentorship, advocacy and influence in relation to decision making and patient care (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Macmillan Cancer Support 2020; National Health Service 2022; Smith et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Paediatric Integrated Cancer Service 2023).

3.3.4 | Research and Scholarship

Twenty-four frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Skills for Health 2021; Spencer and Woodman 2020; Smith et al. 2014; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018) identified that all or most cancer nurses should have broad research capabilities. Novice capabilities included possessing skills to initiate and participate in quality initiatives (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Jakimowicz et al. 2023; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018), contribute to audits (Aranda and Yates 2009; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; Royal College of Nursing 2019, 2022; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Adams and Jones 2018) and be research aware (Aranda and Yates 2009; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022;

National Health Service 2022; Skills for Health 2021; Paediatric Integrated Cancer Service 2023). Knowledge about clinical trials processes such as participation and good clinical practice (GCP) principles (Aranda and Yates 2009; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019; Spencer and Woodman 2020; New Zealand Nurses Organisation Cancer Group 2014; Paediatric Integrated Cancer Service 2023) and facilitating ethical compliance within their scope or role (Spencer and Woodman 2020; Oncology Nurses Society 2010) were identified as core research related capabilities for nurses at all levels in eight frameworks. Thirteen frameworks (Aranda and Yates 2009; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019, 2022; Smith et al. 2014; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023) also reported that cancer nurses, even as a beginner or novice, should demonstrate skills to retrieve, appraise and apply evidence to ensure practice is evidence based. Furthermore, nine frameworks (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2022; Hong Kong Academy of Nursing 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Adams and Jones 2018) reported that nurses who are developing their knowledge, skills and expertise in cancer care should also begin to develop an understanding of research processes and be able to apply to practice. These capabilities included understanding methodologies and design (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; Royal College of Nursing 2022; Hong Kong Academy of Nursing 2020) and assessing quality of evidence (Aranda and Yates 2009; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023). These skills can then enable the development and review of policies and procedures (Aranda and Yates 2009; National Health Service 2022; Oncology Nurses Society 2019; Adams and Jones 2018) or best practice guidelines or pathways (National Cancer Control Programme 2012; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Adams and Jones 2018).

More experienced or advanced practice cancer nurses are expected to build on these fundamental research capabilities to facilitate and participate in cancer research (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019; Children's Cancer and Leukaemia Group 2022; National Cancer Control Programme 2012; Jervis et al. 2021; Oncology Nurses Society 2019) and clinical trials (Oncology Nurses Society 2010), build business cases, write grants and other funding proposals (Jervis et al. 2021). To do this the UK Lung cancer nurses framework (Lung Cancer Nursing United Kingdom 2021) emphasizes the importance of possessing project management skills. Six frameworks (Aranda and Yates 2009; Macmillan Cancer Support 2020; National

TABLE 3 | Competencies and capabilities mapped to the Four Pillars of Practice.

Pillar of Practice	Examples of Competencies and Capabilities Identified in Included Cancer Nursing Frameworks	No of Frameworks
Clinical (n = 28)	Management of cancer symptoms, treatments and oncological emergencies	27
	Psychosocial care/psychological care	20
	Patient education	20
	Communication skills	19
	Follow-up and support services	18
	Professional skills	16
	Holistic assessment	15
	Survivorship	13
	Professional, legal, ethical responsibility and cultural safety	12
	Navigation and coordination	11
	Developing and implementing individualized treatment and care planning	9
	End-of-life/Palliative care	8
	Supportive and therapeutic relationships	7
	Prehabilitation and rehabilitation	6
	Independently prescribing cancer pharmacotherapy	6
	Understanding of occupational safety	5
	The ability to work autonomously	5
	Caseload management and supportive care	4
	The adoption of health technology	3
	Interpretation of investigations	3
Practising culturally congruent care	3	
Provision of appropriate referrals	2	
Facilitation of learning (n = 20)	Demonstrate commitment to continuing development	16
	Facilitate and lead educational opportunities	15
	Ability to identify own learning needs and advocate for educational opportunities	10
	Contributing to education programs locally, nationally and internationally	9
Leadership/ Management (n = 23)	Capabilities to inform and shape service development, evaluation, and reform	15
	Influence and lead policy formulation	13
	Professional leadership (promotion of nursing through committees and organizations to create engagement)	11
	Leadership within the interdisciplinary team	11
	Time and team management	10
	Mentoring skills	8
	Clinical governance and leadership skills	7
	Role modelling	5
	Awareness of policy and procedures	5
	Contribute to operational strategic service development	5
	Build a positive culture	3
	Clinical supervision	3
	Understanding of fiscal requirements of clinical areas	3
	Understanding of risks and stressors involved in caring for people with cancer	3
	Risk management	2
Communication and conflict resolution	2	
Delegation	2	
Understanding of the quality and safety requirements for accreditation	1	

(Continues)

TABLE 3 | (Continued)

Pillar of Practice	Examples of Competencies and Capabilities Identified in Included Cancer Nursing Frameworks	No of Frameworks
Research and Scholarship (n = 24)	Capabilities to retrieve, appraise and apply evidence	13
	Capabilities to initiate and participate in quality initiatives	11
	Understanding of research processes and application to practice	9
	Initiate and lead projects	8
	Contribute to audits	8
	Knowledge about clinical trial processes and ethics	7
	Be research-aware	6
	Facilitate and participate in cancer research	6
	Disseminating work through publication	6
	Promote a climate of clinical enquiry	4
	Facilitating ethical compliance within scope or role	2
	Data management system development	2

Note: Competencies and capabilities heatmap across all included Cancer Nursing Frameworks (n = 29). Values with the highest frequency were assigned a green colour, middle values a yellow and an orange colour, and lower values a red colour.

Cancer Control Programme 2012; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023) suggested that disseminating work through publication should be a capability of advanced nurses. Furthermore, eight frameworks (Aranda and Yates 2009; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019; Royal College of Nursing 2022; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2019) that focussed on highly specialized cancer nurses, suggested they should initiate and lead projects applying a range of quality assurance, research methodologies and approaches and design to identify and address practice gaps. They should also be able to develop systems to collect data (Macmillan Cancer Support 2020; National Health Service 2022), and, importantly, promote a climate for collaborative research and clinical enquiry (Aranda and Yates 2009; Macmillan Cancer Support 2020; National Health Service 2022; Oncology Nurses Society 2019).

A summary of all competencies and capabilities mapped to the Four Pillars of Practice is shown in Table 3.

3.4 | Education Pathways

Education pathways assist practitioners to develop appropriate knowledge and skills to support and demonstrate their capabilities. Twenty frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; Macmillan Cancer Support 2020; National Health Service 2022; Royal College of Nursing 2019, 2022; Spencer and Woodman 2020; Smith et al. 2014; Cancer Institute of NSW 2018; De Souza Institute 2021; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016, 2019; Adams and Jones 2018; Esplen et al. 2018) described education and its role in nursing frameworks. The

synergistic nature of education and nursing pathways were both inward facing, focusing on education required and/or provided to support skill development, and outward facing, focusing on how the framework can support the development of education programs. Pathways focusing on supporting skill acquisition including both formal and informal education pathways were reported in 11 frameworks (Aranda and Yates 2009; European Oncology Nursing Society, 2022; National Health Service 2022; Royal College of Nursing 2019; Smith et al. 2014; De Souza Institute 2021; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Adams and Jones 2018; Esplen et al. 2018; Canadian Association of Nurses in Oncology 2018). Conversely five frameworks (Canadian Association of Nurses in Oncology 2019; Macmillan Cancer Support 2020; National Health Service 2022; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019) articulated how they can be used to support the development of education programs for cancer nurses. Higher education was identified as either expected or advantageous to support clinical skills and knowledge acquisition in nine frameworks (Aranda and Yates 2009; Canadian Association of Nurses in Oncology 2019, 2018; National Cancer Control Programme 2012; National Health Service 2022; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2016, 2019). Although the ONS frameworks did not include education and academic achievement in relation to specialist practice, there are universal expectations available on the ONS website.

3.4.1 | Education to Support Knowledge and Skill Acquisition

The role of education in supporting knowledge and skill acquisition was presented in multiple ways. Two education frameworks were recognized knowledge development programs, these included the De Souza Institutes cancer modules (De Souza Institute 2021; Esplen et al. 2018), the EONS Cancer Nursing Education Framework (European Oncology Nursing Society, 2022). These courses have different levels of intensity providing opportunity for nurses to advance from novices to

advanced clinicians and, in some cases, can be offered as credit for academic courses. Both education frameworks are affiliated with local organizational frameworks. Ten frameworks (Aranda and Yates 2009; National Health Service 2022; Royal College of Nursing 2019; Smith et al. 2014; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) reported evidence of professional development requirements for varying levels of competence and skill development including formal or academic qualifications (Aranda and Yates 2009; National Health Service 2022; Spencer and Woodman 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Canadian Association of Nurses in Oncology 2018) or other forms of educational activities such as workplace-based learning and online platforms (Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Health Service 2022; Royal College of Nursing 2019; Smith et al. 2014; Cancer Institute of NSW 2018; Adams and Jones 2018). Academic or organizational short courses were also identified as educational options in the National Health Service ACCEND framework (National Health Service 2022), these were also fed through the Canadian Learning Pathway into particular health service pathways (Canadian Association of Nurses in Oncology 2018). ONS also provided support on their website (Oncology Nurses Society 2024). Two frameworks (Royal College of Nursing 2022; Oncology Nurses Society 2016) reported that learning outcomes were mapped to competencies as part of the framework, however, the education required to achieve these learning outcomes were not clearly articulated. Five competency frameworks (Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Macmillan Cancer Support 2020; Cancer Institute of NSW 2018; New Zealand Nurses Organisation Cancer Group 2014) reported that they were also designed to help nurses and educators determine professional development or education requirements for themselves and their staff.

3.4.2 | Framework's Role in Education Development

Seven frameworks (Canadian Association of Nurses in Oncology 2019; Macmillan Cancer Support 2020; National Health Service 2022; South African Nursing Council 2020; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Canadian Association of Nurses in Oncology 2018) reported that their documents can be used as an educational development resource. This included helping professional development planning (Macmillan Cancer Support 2020; National Health Service 2022; New Zealand Nurses Organisation Cancer Group 2014; Canadian Association of Nurses in Oncology 2018), and development of educational materials such as orientation manuals, short course programs, and other postgraduate curriculum development and review (Canadian Association of Nurses in Oncology 2019, 2018; National Health Service 2022; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019). The South African competency framework (South African Nursing Council 2020) also recognizes that competencies may overlap with other specialities and therefore could have educational development implications beyond cancer.

3.5 | Career Pathways

Twenty-two frameworks (Evans 2023; Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019, 2022; Spencer and Woodman 2020; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2017, 2019; Esplen et al. 2018; Canadian Association of Nurses in Oncology 2018) described competencies mapped to clinical roles or career development with varying levels of detail. Eight of these frameworks (Evans 2023; Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; National Health Service 2022; Royal College of Nursing 2022; Smith et al. 2014; Paediatric Integrated Cancer Service 2023) recognized that their purpose was intended to guide career development. Seven frameworks (Evans 2023; Aranda and Yates 2009; National Health Service 2022; Royal College of Nursing 2022; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019; Paediatric Integrated Cancer Service 2023; Canadian Association of Nurses in Oncology 2018) report that they should be used by cancer nurses to identify their current level of practice and develop an action plan for career aspirations (National Health Service 2022; Royal College of Nursing 2022). Furthermore, five frameworks (Canadian Association of Nurses in Oncology 2019; Macmillan Cancer Support 2020; Royal College of Nursing 2022; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2019) also reported that they should be used by hospital managers or administrators to guide role development, job descriptions and succession planning.

In many of the UK frameworks, roles were mapped to formal education attainment with a minimum of undergraduate degree for base level nurses, postgraduate certificate or diploma for intermediate level nurses and masters to Doctorial level for proficient and advanced level nurses (Evans 2023; National Health Service 2022; Royal College of Nursing 2019; Spencer and Woodman 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021). The Canadian Learning framework articulated national expectations that include 3900h of practice and examination for certification as a specialist cancer nurse or palliative care nurse (Canadian Association of Nurses in Oncology 2018), similarly ONS also supports expectations for certification (Oncology Nurses Society 2024). Seventeen frameworks (Evans 2023; Aranda and Yates 2009; Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Jakimowicz et al. 2023; Royal College of Nursing 2019; Smith et al. 2014; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2017; Paediatric Integrated Cancer Service 2023; Esplen et al. 2018; Canadian Association of Nurses in Oncology 2018)

mapped the clinical practice competencies and capabilities to specific roles titles or levels of nurse and defined these levels of practice through expected skills, knowledge and experience. Six frameworks (Children's Cancer and Leukaemia Group 2022; Jakimowicz et al. 2023; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Oncology Nurses Society 2017, 2019) that were focused on advanced practice nursing roles defined the role and reported the pre-requisite qualifications/education required, however, did not identify the pathway needed to reach that level.

4 | Discussion

The aim of this review was to provide a comprehensive international profiling of all existing cancer specialist nursing frameworks, including practice, education and career frameworks. To our knowledge, this is the first review capturing cancer nursing frameworks worldwide. All included frameworks were developed to guide nurses in providing high-quality, effective, and safe oncological care. Most of the cancer nursing frameworks in this review are from well-developed, high-income countries, including the United Kingdom, United States of America, Australia, Canada, Europe, Hong Kong, Ireland, and New Zealand. There were no frameworks identified from low-middle-income countries where cancer care challenges such as the nursing workforce crisis, limited career prospects and lack of professional standards are crucial concerns (Young and Samadi 2022; Paterson et al. 2024; Doumit et al. 2024). Accordingly, the development of cancer nursing frameworks in low-middle countries should be supported as a priority. Identified frameworks covered the four pillars of practice to varying degrees. Unsurprisingly, the clinical pillar was the most comprehensively covered pillar in 28/29 frameworks.

The large number ($n=29$) of cancer nursing frameworks identified in this review reflect the increasing recognition of cancer nursing as a specialty. Cancer nurses manage symptoms and treatments in nurse-led, face-to-face and telehealth clinics, have been shown to improve access to timely care (Mason et al. 2013; Clinical Oncology Society of Australia 2015), decrease wait times in the emergency departments (Thamm et al. 2019) and provide continuity of care in fragmented healthcare systems (Clinical Oncology Society of Australia 2015; Lattimer 2013). Achieving these important outcomes requires specialized knowledge and skills, highlighting the critical need for frameworks that articulate capabilities and provide the professional development necessary to develop these cancer specific skills and the various roles required to perform them. However, as expected most frameworks focused on capabilities and/or competencies, with only a few addressing all three elements of a comprehensive framework. This is an important consideration for future framework development as nurses have emphasized that linking professional development with career aspirations is crucial for recruitment and retention in this specialty (Bradford et al. 2023).

The frameworks cover a wide range of competencies that cancer nurses should possess. These varied depending on the focus of the specific frameworks and nursing roles. The most common competencies across the various frameworks reflected

key features that shape the role of the specialist cancer nurse such as patient assessment (Canadian Association of Nurses in Oncology 2019, 2018; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; Royal College of Nursing 2019; Skills for Health 2021; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; Oncology Nurses Society 2019; Adams and Jones 2018), communication (Children's Cancer and Leukaemia Group 2022; Children's Cancer and Leukaemia Group and Teenagers and Young Adults with Cancer 2023; European Oncology Nursing Society, 2022; National Cancer Control Programme 2012; National Health Service 2022; Royal College of Nursing 2019; Royal College of Nursing 2022; Skills for Health 2021; Hong Kong Academy of Nursing 2020; South African Nursing Council 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2010; Oncology Nurses Society 2017; Oncology Nurses Society 2019; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018) and toxicity and symptom management (Children's Cancer and Leukaemia Group 2022; Macmillan Cancer Support 2020; National Cancer Control Programme 2012; National Health Service 2022; Spencer and Woodman 2020; Cancer Institute of NSW 2018; De Souza Institute 2021; Hong Kong Academy of Nursing 2020; Lung Cancer Nursing United Kingdom 2021; Jervis et al. 2021; New Zealand Nurses Organisation Cancer Group 2014; Oncology Nurses Society 2016, 2019; Paediatric Integrated Cancer Service 2023; Adams and Jones 2018; Canadian Association of Nurses in Oncology 2018). Although most frameworks described competency standards for cancer nurses to aspire to, many used the terms competency and capability interchangeably, however, by definition, they are not the same. There is a growing argument that competencies alone are not sufficient to guide specialist practice in increasingly complex health care environments O'Connell, Gardner, and Coyer (2014). The term competent generally denotes a definitive state, either one is competent or not (Mills et al. 2020). Competencies are predominately task-focused and assess predictable situations which is incongruent with many nursing frameworks' aspirations to guide cancer nurses to continuously grow, develop and adapt to new technologies, roles, and areas of practice. Conversely, capable learners are seen as creative and flexible and adaptable in their responses to a changing situation by trusting intuition, judgement and using acquired knowledge and skills in new ways O'Connell, Gardner, and Coyer (2014). Arguably, capability over competency is a necessary part of specialist expertise and capable people continue to develop their specialist skills and knowledge long after they are competent O'Connell, Gardner, and Coyer (2014). This needs to be a consideration when developing cancer nursing as a specialty.

This critical synthesis of cancer nursing frameworks also emphasized the importance of all cancer nurses being '*research ready*', enabling them to effectively retrieve, appraise, and apply evidence, including possessing knowledge about research processes and clinical trials. For more advanced roles this included a sound demonstration of leadership to be proficient in developing business cases, grant proposals, and other funding

applications, and included dissemination capabilities through publications and conference presentations. There was a cross-cutting acknowledgment that cancer nurses should be capable of initiating and participating in quality improvement initiatives, including clinical audits. While these capabilities were identified as important, a critical implementation gap remains in developing and sustaining clinical academic nurses career trajectories (Paterson and Strickland 2023). Currently, there is a lack of infrastructure to mobilize and achieve the needed growth in clinical academic nursing pathways, which continues to lag considerably behind medical counterparts (Avery, Westwood, and Richardson 2022). There are no distinct entry points to clinical academic nursing careers, no clear models of benchmarking career progression, and overall fewer funding opportunities to support clinical academic fellowships in nursing more broadly, let alone cancer nursing (Trusson, Rowley, and Bramley 2019).

There was also notable lack of digital capabilities described across the frameworks which is surprising given the wide-scale rollout of health information systems for the delivery of cancer care (Shelley et al. 2024), telehealth for remote monitoring and consultations (Paterson et al. 2020), and implementation of mobile health applications (apps) (Paterson et al. 2020) to name a few examples. There has also been a rapid uptake of Artificial Intelligence (AI) in cancer care (Papachristou et al. 2023) and emerging AI studies being led in cancer nursing (O'Connor et al. 2024) mostly using electronic datasets to identify factors that improve health outcomes for those with cancer. As digital technologies and AI techniques are becoming increasingly used in cancer nursing and cancer care it seems that further developing nurses' capabilities in digital technologies, and having these reflected in educational offerings would be important in building nurses' abilities to interpret outputs and develop data-drive interventions.

The variations noted in cancer nursing frameworks highlights the different roles and responsibilities of cancer nurses around the world, adding to the complexity of developing frameworks relevant to all. The International Council of Nurses have long recognized that scope of practice, minimum standards for education and practice and maintenance of competence is required to bring order and consistency to nursing specialities such as cancer care (World Health Organisation 2020b). Studies globally have highlighted ongoing challenges with the lack of definition and broad nomenclature used to describe different specialist nursing roles (Dowling et al. 2024), particularly in cancer care (Bradford et al. 2023). These variation in roles and role titles risk diluting the fundamental expected skills of cancer nurses and challenges the creation of clear career pathways for nurses to aspire to (McErlean, Paterson, and Thamm 2024). Robust and transparent comprehensive frameworks and pathways can be part of the solution to support professional growth, job satisfaction and retention (McErlean, Paterson, and Thamm 2024). Credentialing such as that used in the United States of America (Oncology Nurses Society 2024) and Canada (Canadian Association of Nurses in Oncology 2018) may need to be investigated more broadly to help define requirements for specialisation in such a complex area as cancer care.

4.1 | Strengths and Limitations

A strength of this review included the adherence to a systematic and rigorous methodology that included a comprehensive search of peer reviewed and grey literature, and independent screening. Although not required of a scoping review, doing a quality appraisal using a validated tool for policy documents helped to identify the quality of the frameworks included. This study has some limitations, however. The heterogeneity of included frameworks impacted the ability to thoroughly compare and analyse them. We were also limited to only including frameworks available in English which may have meant that we missed frameworks from organizations that did not have published English versions. Finally, some organizations only allow documents to be accessed by members, while we made every endeavor to request access to these types of documents, some may have been missed.

4.2 | Conclusions

Oncology nurses are at the center of managing the global burden of cancer through education, prevention, screening, treatment, survivorship, palliative care and research (Yates et al. 2020; Young et al. 2020). This comprehensive capture and synthesis of the capabilities, educational components, and career pathways outlined in existing cancer nursing frameworks worldwide highlights areas of improvement that are needed to support professional growth, job satisfaction and retention of cancer nurses. The establishment of comprehensive cancer nursing frameworks are pivotal in enabling nurse leaders to grow and develop the cancer nursing workforce globally. They are also integral to support cancer nurses in providing high-quality, effective, and safe care for patients and their families across the cancer continuum.

Author Contributions

All authors have agreed on the final version and meet at least one of the following criteria: (1) substantial contributions to conception and design, acquisition of data or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that supports the findings of this study are available in the [Supporting Information](#) of this article.

Peer Review

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.16657>.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.