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Integrated Care Models for Cancer Survivors: Conceptual Framework, Characteristics, and Implications for China (Postprint)

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Date: 2024-01-31T00:00:00+00:00

Abstract

Cancer represents a major global public health challenge. The continuous increase in cancer incidence and prolonged survival duration have resulted in a sustained rise in the number of cancer survivors. Cancer survivors confront complex challenges across physical, psychological, and social care dimensions, and their care services necessitate effective cross-field, cross-departmental, and cross-disciplinary collaboration and integration. Establishing an integrated care model for cancer survivors has emerged as a crucial strategy for nations worldwide to address the challenges of cancer survivorship care. However, the development of cancer survivorship care in China remains relatively underdeveloped. This article systematically reviews and synthesizes the conceptual frameworks, characteristics, applications, and implementation progress in China of current representative integrated care models for cancer survivors. Drawing upon the status of China' s health service system, it proposes recommendations across five dimensions: consensus building, pilot exploration, workforce development, strengthening primary care, and policy support, aiming to provide reference and guidance for the design and implementation of integrated care strategies for cancer survivors in China.

Full Text

Integrated Care Models for Cancer Survivorship: Conceptual Framework, Characteristics, and Implications for China

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Abstract

Cancer is a significant global public health issue. With continuously rising cancer incidence rates and prolonged survival times, the number of cancer survivors is steadily increasing. Cancer survivors face complex challenges across physical, psychological, and social care dimensions, requiring effective coordination and integration across disciplines, sectors, and domains. Establishing integrated care models for cancer survivors has become an important strategy for addressing survivorship care challenges worldwide. However, the development of cancer survivorship care in China remains relatively lagging. This article synthesizes and summarizes the conceptual frameworks, characteristics, applications, and practical progress in China of current representative integrated care models for cancer survivors. Based on the status of China' s healthcare service system, we propose recommendations from five aspects: establishing consensus, pilot exploration, workforce development, strengthening primary care, and policy support, aiming to provide reference for designing and implementing integrated care strategies for cancer survivors in China.

Keywords: Cancer survivors; Integrated care models; Survivorship care system; Health services

Funding: National Natural Science Foundation of China (72004104); Nantong Municipal Health Commission Research Project (MSZ2023043); Nantong University Clinical Medicine Special Project (2022LZ011)

Citation: ZHAO MM, GAO YX, XU YF, et al. Integrated care models for cancer survivorship: conceptual framework, characteristics and implications to China[J]. Chinese General Practice, 2024. [Epub ahead of print]. DOI: 10.12114/j.issn.1007-9572.2023.0803.

Introduction

Cancer is a major public health threat to population health. According to the latest global cancer burden data released by the International Agency for Re-

search on Cancer (IARC) under WHO, there were 19.29 million new cancer cases worldwide in 2020, with China accounting for 4.57 million cases (23.7% of the global total), averaging 7.5 new diagnoses per minute—the highest in the world[1]. With advances in screening and diagnostic-therapeutic technologies, cancer survival rates and survival times continue to improve, and cancer is increasingly recognized as a manageable and controllable chronic disease, enabling more patients to live long-term with cancer. The National Coalition for Cancer Survivorship (NCCS) defines cancer survivorship as encompassing all individuals from the time of cancer diagnosis until the end of life, including family members, friends, and caregivers who are also affected by cancer[2]. According to China' s National Cancer Center data, the five-year cancer survival rate in China has increased from 30.9% to 40.5%[3]. The continuously rising incidence and prolonged survival mean that the number of cancer survivors in China will continue to grow.

Cancer is a highly complex disease characterized by long-term, multifaceted, and diverse features. Its treatment may involve multiple specialties and require frequent transitions between different types of services. However, differences in institutional affiliations, management systems, and operational mechanisms across service providers exacerbate sectoral fragmentation, interest segmentation, and operational silos in care delivery, resulting in uncoordinated, fragmented services that fail to meet survivors' needs[4]. Additionally, cancer survivors face unique challenges beyond treatment side effects, pain, and fatigue—including persistent psychological, economic, and social difficulties[5]. Their care needs extend beyond cancer disease management itself, necessitating a systematic care and support system that is cross-sectoral, cross-departmental, cross-disciplinary, and multi-level to prevent and manage multidimensional challenges in both cancer and non-cancer domains.

Integrated care has been widely applied in healthcare services, yet its concept and connotation lack consensus and a unified terminology[12-13]. Integrated care can be traced back to ancient Greek medical practices emphasizing both physical and psychological symptoms, and began to be applied in child and elderly care in the 1970s[14]. Since the 1990s, WHO has called on countries to emphasize service resource integration and establish people-centered integrated health systems, with nations subsequently implementing and optimizing practices according to their contexts. Thereafter, integrated care has become a foundational policy for addressing chronic disease and aging society challenges[15]. In 2001, WHO defined integrated care as "a service model that comprehensively coordinates and integrates inputs, delivery, management, and organization of services related to diagnosis, treatment, care, rehabilitation, and health promotion, aiming to improve service accessibility, quality, patient satisfaction, and service efficiency" [16]. Scholars have also proposed understandings from perspectives of service organization processes[17], cross-health and social sector integration[18], and patient participation and empowerment[19].

With advancing practice, WHO' s 2015 Global Strategy on Integrated People-

Centered Health Services defined integrated health services as "coordinated and consistent health services delivered and managed across different levels and sites within and beyond the health sector, enabling people to receive continuous health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation, and palliative care throughout their lives according to their needs" [20]. This definition emphasizes people-centeredness, coordinated division of labor, and service continuity. Since then, the concepts of integrated care and integrated health services have been used interchangeably[14,21]. Due to different health system priorities and varying disciplinary perspectives across countries and scholars, integrated care' s connotation and practice models differ, making it a comprehensive concept encompassing service processes (how services are delivered), outcomes (what services are delivered), or philosophies (underlying values of service provision)[15,22].

Literature Search Strategy: We conducted computer searches of Web of Science, PubMed, CNKI, and Wanfang Data from inception to September 2023. Chinese search terms included "cancer," "cancer survivors," "integrated care," "integrated services," and "care model." English search terms included "cancer survivors/survivorships," "integrated care," "integrated health care," "integrated service," and "care model." Inclusion criteria comprised literature on theories, empirical studies, and reviews related to integrated care for cancer survivors, focusing on representative publications from the past five years, with classic and theoretically relevant literature appropriately included regardless of publication date. Exclusion criteria comprised irrelevant literature, unavailable full texts, duplicate publications, or poor-quality studies.

1. Conceptual Connotation of Integrated Care for Cancer Survivors

Integrated care for cancer survivors should be understood as a series of approaches and models whose core connotation lies in coordinating, connecting, and collaborating within and across health departments to solve service fragmentation and segmentation, providing coordinated, continuous, and comprehensive care to improve survivors' quality of life and service experience, enhance service quality and efficiency, and increase affordability[23-24]. Health service system integration provides the foundation for cancer survivors to access comprehensive, systematic care. Based on the meso- and micro-levels of the Rainbow Model, this article introduces representative models in cancer survivorship care that emphasize organizational, professional, or clinical integration characteristics (Table 1). Coordinated care and continuity of care models focus on organizational integration, as both involve collaboration and integration among different institutions and providers to ensure service continuity and coordination across time, institutions, and locations. Interdisciplinary shared care and supportive care models emphasize professional integration, as they stress collaboration and integration among providers from different specialties to meet patients' multifaceted needs. Multidisciplinary diagnosis and treatment care and

shared medical appointment models emphasize clinical integration, as both involve providing multidisciplinary coordinated services to patients within a single care process to promote comprehensive, personalized care and improve quality and efficiency.

2. Representative Models of Integrated Care for Cancer Survivors

Due to different health system contexts, countries have developed varying models and depths of integrated care for cancer survivors. Valentijn et al.[22] proposed the Rainbow Model of integrated care based on a systematic literature review. The model uses "people-centeredness" and "population-based" as guiding principles, vertically encompassing "macro-meso-micro" levels and horizontally involving "functional integration" and "normative integration" as connecting elements across levels. System integration occurs at the macro level, referring to all institutions following the same rules and policies (also called system integration). Organizational and professional integration occur at the meso level, establishing cross-institutional cooperation and governance relationships or cross-professional partnerships to provide comprehensive, continuous services. Clinical integration occurs at the micro level, providing coordinated services across time, location, and discipline within a single care process[25].

2.1 Coordinated Care Model and Continuity of Care Model

2.1.1 Coordinated Care Model Coordinated care currently lacks a unified concept. WHO defines it as "proactively connecting care providers to meet patient needs and ensure they receive integrated, people-centered care across various settings" [26]. The Agency for Healthcare Research and Quality (AHRQ), after reviewing over 40 concepts, proposes that "coordinated care involves multiple participants in patient care (including patients themselves) consciously organizing to facilitate appropriate health service delivery, involving personnel and resource allocation, and managed through information exchange among different entities" [27]. Thus, coordinated care emphasizes communication, exchange, collaboration, and information sharing among service providers to promote consistent and coherent care plans and ensure proper linkages across all segments, aiming to provide the right service at the right time and place[28].

Patient navigation is the most representative innovative model within coordinated care. Initially proposed by the American Cancer Society (ACS) in 1989 at a hearing on cancer among impoverished populations, patient navigation aims to address structural barriers in cancer diagnosis, treatment, and care—such as financial difficulties and transportation problems—through community-based interventions, promoting timely diagnosis and coordinated treatment for cancer and other chronic diseases, and ultimately reducing or eliminating cancer-related disparities[30]. In 1990, Freeman et al.[31] formally proposed the patient navigation model for underserved breast cancer populations. The core objec-

tive is to facilitate coordination for cancer patients navigating complex medical services, serving as a guiding mechanism to help patients flow timely through complex healthcare systems. "Navigators"can be healthcare professionals (physicians, nurses, social workers) or non-professionals (peer patients, caregivers) who must effectively communicate with providers and stakeholders, supporting and guiding patients and families within and across institutions, assisting with finding healthcare facilities, scheduling appointments, understanding diagnoses and treatment options, ensuring optimal and timely cancer treatment, and effectively utilizing available care resources[32]. Patient navigation has evolved into a fundamental strategy for addressing access barriers for cancer survivors[33], with implementations in the US, Canada, UK, and Brazil demonstrating positive effects in improving cancer screening participation, reducing time from screening to diagnosis and treatment initiation, decreasing aggressive treatments and readmission rates, and improving quality of life and satisfaction[34-35]. In China, patient navigation applications have focused primarily on nursing navigation models[36-38].

2.1.2 Continuity of Care Model Continuity of care is a core value and component of primary healthcare, now recognized by many countries as an important strategy for overcoming health system fragmentation[39]. WHO defines continuity of care as "the degree to which a series of discrete healthcare events over time are experienced as coherent, connected, and consistent with patient needs and preferences"[26]. It is a multidimensional concept mainly includes[26]: (1) Informational continuity—coherent clinical or psychosocial information across time or settings; (2) Interpersonal continuity—maintaining good relationships with one or more healthcare providers; (3) Longitudinal continuity—long-term interaction with the same physician or team across discrete care experiences; and (4) Management continuity—shared management plans and care protocols among providers with effective communication and collaboration to ensure continuous care. Management continuity is highly consistent with coordinated care, making continuity and coordination interrelated concepts[40].

Subjective experience, temporal continuity, and locational continuity are core elements[41-42]. Subjective experience emphasizes that continuity is not a characteristic of providers or organizations but patients'subjective perception of service coordination and integration. Temporal continuity emphasizes that healthcare systems should provide continuous services from initial contact, with care continuing as patients progress through different disease stages—such as transitioning from pediatric to adult care or from intensive treatment to hospice care[43]. Locational continuity emphasizes service continuity when patients transition between care settings, typically extending from hospital to community and home.

China' s continuity of care practice and research have concentrated in nursing, also called "continuous nursing," "extended nursing," or "transitional care," commonly defined as "a series of actions designed to ensure patients receive coordinated and continuous care at different levels across healthcare settings (e.g.,

different hospital departments), typically referring to continuity from hospital to community and home, including discharge planning, referrals, and ongoing follow-up and guidance after returning to community or home" [43]. Research has primarily focused on continuity nursing interventions during pre-discharge and post-discharge periods[44-45].

2.2 Interdisciplinary Shared Care Model and Supportive Care Model

2.2.1 Interdisciplinary Shared Care Model The interdisciplinary shared care model is an integrated care strategy where multidisciplinary professionals jointly assume responsibility for cancer survivor care[46]. Multidisciplinary experts form teams to discuss and develop care plans, with each professional responsible for specific domains or stages according to their role and competencies to ensure comprehensive support[47]. The model includes horizontal integration—collaboration among different medical and care specialists (e.g., oncologists, psychologists, internists, consultants)—and vertical integration—referrals and collaboration between primary and specialist oncology institutions[47]. Cooperation and responsibility-sharing between general practice and oncology specialties are core components[48-49].

This model emphasizes collaboration, with the core concept of distributing care tasks: assigning acute cancer care to oncology specialists while allocating long-term survivorship care to non-oncology physicians, helping alleviate oncology specialist shortages[50]. Care arrangements should be determined based on risk stratification assessments considering survivors' basic information (age, sex), cancer type, comorbidities, treatment history, and recurrence risk, classifying them into high, medium, and low risk categories[47]. Low-risk survivors typically require basic follow-up and treatment by primary care institutions and general practitioners; medium-risk survivors need more complex follow-up to prevent or monitor late effects, requiring joint planning by specialists and primary care physicians; high-risk survivors require highly customized follow-up and treatment plans with regular specialist consultations and complex examinations, implemented through specialist-led care with primary care coordination[51]. A schematic diagram of this model is shown in Figure 1 [Figure 1: see original paper].

The interdisciplinary shared care model provides personalized care according to survivors' needs and conditions through vertical and horizontal integration, coordinating cooperation among different professional teams to deliver comprehensive, integrated care that embodies people-centered service philosophy[47]. However, implementation generally requires coordinators—such as survivorship care institutions or specialist nurses—to manage vertical and horizontal coordination, demanding substantial resources and posing implementation challenges that limit its use and promotion. China has not yet established a mature and effective shared care model.

2.2.2 Supportive Care Model Supportive care, also called supportive therapy, was initially proposed by Fitch[52] to provide necessary services for cancer patients or those in rehabilitation to meet their informational, emotional, spiritual, social, or physical needs during diagnosis, treatment, bereavement, and end-of-life care. The Multinational Association of Supportive Care in Cancer (MASCC) defines cancer supportive care as "preventing and managing adverse effects of cancer and its treatment, including management of physical and psychological symptoms throughout the continuum from diagnosis through treatment and post-treatment care, aiming to improve rehabilitation, prevent secondary cancers, enhance survival, and improve end-of-life care quality" [53]. Supportive care recognizes that cancer survivorship care extends beyond active treatment to emphasize long-term follow-up and support, ensuring survivors receive continuous monitoring, follow-up, and management of long-term outcomes, recurrence risks, and other related issues throughout their survivorship journey to improve overall outcomes and long-term wellbeing[54]. Palliative and hospice care are considered important forms of supportive care[55], while the model also emphasizes caregivers' roles in promoting their health and wellbeing while actively participating in patient care[56-57].

Supportive care emphasizes multidisciplinary, cross-sectoral integration involving oncologists, psycho-oncologists, nurses, rehabilitation therapists, social workers, and family physicians to address multiple challenges facing survivors and caregivers[58]. Supportive care needs assessment is a critical component[59], enabling personalized, targeted services and optimizing resource allocation by comprehensively understanding survivors' and caregivers' specific needs[60]. Current practice and research primarily focus on survivors' and caregivers' needs beyond medical interventions—preventing, controlling, or alleviating complications and adverse reactions[61-62].

China has accumulated rich research and practice in supportive care. The Cancer Nutrition and Supportive Care Committee of the Chinese Anti-Cancer Association first proposed the SPENCER model for cancer supportive care, encompassing Spiritual support (S), Pharmacologic/symptom treatment (P), Exercise therapy (E), Nutrition therapy (N), Communication (C), Emotion management (E), and Rehabilitation activities (R)[64]. Extensive research and practice have also been conducted in supportive care needs assessment and interventions[65-67], though further policy and resource strengthening is needed to promote development.

2.3 Multidisciplinary Diagnosis and Treatment Care Model and Shared Medical Appointment Model

2.3.1 Multidisciplinary Diagnosis and Treatment Care Model Multidisciplinary diagnosis and treatment involves a relatively fixed expert group from multiple disciplines that convenes at regular times and locations to discuss patient cases, formulate optimal treatment plans based on comprehensive disciplinary input, and implement decisions through relevant disciplines or mul-

tidisciplinary joint execution[68]. Originating in the US, the multidisciplinary diagnosis and treatment model has been widely adopted in Europe, the US, Australia, Canada, UK, and New Zealand, and is considered the gold standard for cancer care delivery[69]. The model fully embodies people-centered care and is essential to integrated medicine. Beyond medical treatment, it now incorporates psycho-oncologists and medical social workers to address patients' and families' psychological and social issues[70], though its focus generally remains on cancer diagnosis, treatment, and related outcomes.

Specialized multidisciplinary "one-stop" clinics have emerged for certain cancers (e.g., breast, prostate), representing essentially the same model. In these clinics, patients receive consecutive assessments and diagnoses from multiple experts (e.g., breast surgeons, geneticists, genetic counselors, oncologists) in a single visit, with optional psychological services and mental health screening to assess need for further intervention[71]. This avoids repetitive medical care and time waste from multiple facility visits, while interprofessional collaboration facilitates better understanding of conditions and development of more comprehensive, personalized treatment plans at earlier disease stages.

China had early prototypes of multidisciplinary oncology teams in the 1970s. After decades of development, multidisciplinary oncology diagnosis and treatment has been widely applied in gastric cancer, colorectal cancer liver metastasis, pancreatic cancer, esophageal cancer, and liver cancer. Following the National Health Commission' s 2018 "Notice on Launching Pilot Work for Multidisciplinary Oncology Diagnosis and Treatment" [72], China' s multidisciplinary oncology pilot work has accelerated, with the model now incorporated into expert consensus and guidelines for standardized cancer diagnosis and treatment.

2.3.2 Shared Medical Appointment Model Shared medical appointments, also called group medical visits, are an innovative, interactive appointment model proposed by Dr. Noffsinger in 1999. It convenes patients with common needs with one or more healthcare providers in a group setting for extended medical evaluation, treatment, or health education[73-74]. Initially applied to diabetes, the model has expanded to cancer survivorship[75-76].

Shared appointments typically last 90 minutes with 12-15 patients, combining group peer support with one-on-one clinical services. Patients participate in collective discussions, listening to and engaging with others' consultations, while also having individual discussions with providers about personal health issues, diagnoses, and prescriptions to address personalized needs[77]. Advantages include more provider interaction time, support network development, experience and knowledge sharing, improved provider efficiency, and reduced waiting times[78]. Implementation challenges include organizational management, patient privacy concerns, acceptance, and professional training. China has not yet conducted research or practice on cancer shared medical appointments.

3. Recommendations for Establishing Integrated Care Models for Cancer Survivors in China

China currently lacks effective integrated care models for cancer survivors. Related practices and intervention research concentrate primarily in nursing, with a "treatment-heavy, care-light"tendency in cancer services. Substantial resources focus on medical treatment, while psychosocial care resources are relatively insufficient, and inter-sectoral coordination is lacking, hindering effective integrated care delivery. Additionally, primary care capacity remains weak, with many grassroots institutions lacking necessary equipment, qualified personnel, and appropriate technologies for complex, multidimensional cancer survivorship care. Faced with growing survivorship care demands, particularly amid population aging and rising cancer prevalence, establishing integrated care models should become a priority in China' s cancer prevention and control efforts. This will help provide comprehensive, continuous, and efficient care, improve rehabilitation outcomes and quality of life, and enhance overall cancer prevention and treatment effectiveness.

3.1 Establishing Consensus or Guidelines for Integrated Cancer Survivorship Care

Establishing consensus or guidelines helps ensure consistent understanding, guiding principles, and action plans among all stakeholders, particularly medical and social care professionals. Consensus or guidelines should include clear care service objectives, multidisciplinary team cooperation protocols, personalized care plan development, family and community support service guidelines and process standards, care quality assessment and continuous improvement measures, information sharing and coordination management, and education and training. Development should engage multidisciplinary experts from medicine, sociology, psychology, and management, along with relevant stakeholders, through detailed discussion and research, with iterative revision based on practical experience. Government and relevant departments should provide support and guidance, promoting understanding through publicity, training, and education, encouraging voluntary adoption by healthcare institutions and providers.

3.2 Conducting Pilot Explorations of Integrated Care Models

China has promoted integrated healthcare delivery system construction, including regional medical consortia, county medical communities, and specialty alliances, along with integrated medical-preventive health systems, providing strong opportunities for piloting integrated cancer survivorship care. Within regional medical consortia, we can explore resource sharing and vertical division of labor among institutions to achieve care linkage, referral services, and collaborative models. Within county medical communities, we can establish community-based cancer care teams to undertake health management, psychosocial support, rehabilitation guidance, and follow-up for patients treated at higher-level institutions. Within specialty alliances, we can explore close cooperation between

cancer specialties at different levels to jointly develop tiered care plans and provide comprehensive support. Additionally, we can leverage medical-preventive integration to incorporate cancer survivorship health management and rehabilitation guidance into primary health or public health service systems.

3.3 Developing a Professional Workforce for Integrated Cancer Survivorship Care

Effective workforce development requires cultivating and recruiting various professionals and establishing career development mechanisms. First, we should focus on developing management talent to coordinate, plan, and supervise care operations, potentially selected and trained from health administrative departments or oncology hospital administrative and clinical management staff. Second, we should cultivate coordination talent to serve as bridges in cross-sectoral cooperation, potentially through establishing full-time social work departments in hospitals to coordinate service resources. Additionally, we need skilled service professionals, including general practitioners, nurses, and rehabilitation therapists, while urgently establishing caregiver training systems with professional certification, career paths, and advancement opportunities to attract talent.

3.4 Enhancing Primary Care Capacity for Cancer Survivorship Care

International experience demonstrates primary care institutions' critical role in survivorship care. China has implemented multiple cancer early diagnosis and treatment programs that continuously enhance primary care capacity[79]. Future efforts can build on these programs through resource decentralization (下沉) and task integration to further improve primary institutions' cancer prevention and treatment effectiveness. We should strengthen medical staff training and knowledge updating, particularly in cancer care-related knowledge and skills, to improve primary care capabilities in cancer rehabilitation, psychosocial support, and end-of-life services. Additionally, targeted training of primary care medical students in oncology or general practice through targeted training (定向培养) programs can broaden talent channels and enhance service capacity.

3.5 Strengthening Policy Support for Integrated Cancer Survivorship Care

Sustainable policy support is crucial. Governments should optimize resource allocation, issue guidance documents, purchase services, provide funding, and establish specialized institutions to guide and organize integrated care. Additionally, we can explore innovative payment policies through medical insurance or long-term care insurance, covering cancer care service items and increasing reimbursement for rehabilitation and psychological support to reduce patient financial burden while providing economic incentives for providers.

In summary, this article systematically reviews representative integrated care models' conceptual frameworks, characteristics, and applications, proposing so-

lutions to China' s survivorship care challenges to promote integrated care development and improve care quality. Future research should focus on: (1) deeper conceptual understanding and evaluation of existing models' applicability and effectiveness in China to identify suitable models; (2) in-depth studies on application effects in specific populations; and (3) exploration of policy, regulatory, and management system reforms to promote implementation. Such research will further advance China' s integrated cancer survivorship care models and enhance cancer prevention and treatment effectiveness.

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