

Organizational knowledge and capabilities in healthcare: Deconstructing and integrating diverse perspectives

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Abstract

Diverse concepts and bodies of work exist in the academic literature to guide research and practice on organizational knowledge and capabilities. However, these concepts have largely developed in parallel with minimal cross-fertilization, particularly in the healthcare domain. This contributes to confusion regarding conceptual boundaries and relationships, and to a lack of application of potentially useful evidence. The aim of this article is to assess three concepts associated with organizational knowledge content—intellectual capital, organizational core competencies, and dynamic capabilities—and to propose an agenda for future research. We conducted a literature review to identify and synthesize papers that apply the concepts of intellectual capital, organizational core competencies, and dynamic capabilities in healthcare settings. We explore the meaning of these concepts, summarize and critique associated healthcare research, and propose a high-level framework for conceptualizing how the concepts are related to each other. To support application of the concepts in practice, we conducted a case study of a healthcare organization. Through document review and interviews with current and former leaders, we identify and describe the organization's intellectual capital, organizational core competencies, and dynamic capabilities. The review demonstrates that efforts to identify, understand, and improve organizational knowledge have been limited in health services research. In the literature on healthcare, we identified 38 papers on intellectual capital, 4 on core competencies, and 5 on dynamic capabilities. We link these disparate fields of inquiry by conceptualizing the three concepts as distinct, but overlapping concepts influenced by broader organizational learning and knowledge management processes. To aid healthcare researchers in studying and applying a knowledge-based view of organizational performance, we propose an agenda for future research involving longitudinal comparative case studies.

Keywords

Health services management, organizational knowledge, intellectual capital, organizational core competencies, dynamic capabilities, Cancer Care Ontario

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Introduction

All organizations, including healthcare organizations, have vast stockpiles of formal and informal knowledge distributed in various “reservoirs”: within and across the minds of their leaders, professionals, and staff, captured in files, databases, and reports, and embedded in the structure, culture, and routines of organizations themselves.^{1,2} Variations in the content, configuration, and management of these knowledge stockpiles may partly explain differences in performance across healthcare organizations.³ Knowledge of which clinical practices lead to better care is a critical element of this equation, but leaders and care providers also require knowledge regarding how to integrate this content into routine practice. An understanding of existing organizational knowledge and capabilities

can facilitate implementation of the strategic, operational, or clinical changes needed to improve care.

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The healthcare literature tends to apply a process-oriented lens to organizational knowledge using concepts such as “organizational learning” (OL) and “knowledge transfer (or exchange),” and to a lesser extent “knowledge management” (KM).^{4–7} As a result, we know more about how to foster a learning climate in healthcare organizations and how to facilitate the flow of knowledge across professional and organizational boundaries than we do about knowledge content, that is, how to identify, characterize, and measure organizational knowledge itself. Varied concepts and bodies of work exist in the academic literature to guide research and practice on organizational knowledge and capabilities. These concepts can be organized into three broad categories: Resources, Competencies, and Capabilities.⁸ Three prominent concepts within each of these categories include intellectual capital (IC), organizational core competencies, and dynamic capabilities, respectively. However, these concepts have largely developed in parallel with minimal cross-fertilization, particularly in the healthcare domain. The fragmented nature of work in this area contributes to confusion regarding conceptual boundaries and relationships, and to a lack of awareness or application of potentially useful evidence.

The aim of this article is to improve our conceptual understanding of three concepts associated with organizational knowledge *content*, namely, IC, organizational core competencies, and dynamic capabilities. IC refers to intangible organizational resources,⁹ core competencies are areas of specialized expertise that are widely shared across the organization,¹⁰ and dynamic capabilities represent an organization’s ability to integrate, build, and reconfigure resources and competencies to match the requirements of a changing environment.¹¹ These concepts originate from rich bodies of literature in organization science, information science, and social psychology; their application in the healthcare industry is a relatively limited, albeit growing, phenomenon.^{12–14} We will explore the theoretical and disciplinary roots of these concepts, as well as their similarities and differences, and their value to healthcare management research and practice. We also propose a high-level framework for conceptualizing how the concepts are related to each other and to the processes of KM and OL. We close with an agenda for future research.

Methods

Our literature search strategy was guided by two aims: (1) to identify seminal papers that describe the definition, dimensions, scope, and theoretical basis of the concepts and (2) to identify and synthesize papers that apply the concepts in healthcare settings. We searched Scopus and Google Scholar databases to identify relevant papers. Seminal papers and books were identified by searching each term separately (e.g. “intellectual capital”) and selecting papers with the highest number of citations and most detailed description of the concept. We defined seminal papers as those with at least 100

citations, but the majority of the included papers had citations numbering in the thousands. Papers applying the concepts in healthcare settings were identified by searching each term (e.g. “intellectual capital”) paired with the terms “healthcare,” “health system,” or “health service.” To supplement the review’s focus on concepts associated with organizational knowledge *content* and to enhance the conceptual discussion, we included papers on organizational knowledge *processes*, specifically KM and OL, both of which were frequently mentioned in papers included in the review. We identified seminal papers on all five concepts (IC, organizational core competencies, dynamic capabilities, KM, and OL). However, in accordance with the aim of this article, our synthesis of healthcare papers was focused only on three concepts, namely, IC, organizational core competencies, and dynamic capabilities. Only papers published in academic journals and published between 1990 and 2015 were considered for inclusion. The reference lists of included papers were also reviewed to identify additional relevant papers.

To illustrate the practical implications of the conceptual discussion herein, we conducted a case study of a healthcare organization with a complex mandate explicitly rooted in creating, sharing, and using knowledge and evidence to improve health system performance. Cancer Care Ontario (CCO) is the provincial organization responsible for monitoring and improving cancer and renal services, conducting data analytics for access to care indicators for other key healthcare services, and providing capacity planning services at the request of Ontario’s Ministry of Health and Long-Term Care. CCO allocates approximately CAD\$1.5 billion in funding to hospitals and other cancer and renal providers, and employs over 1000 staff members. Document review and semi-structured interviews were used to identify CCO’s IC, organizational core competencies, and dynamic capabilities. We conducted a review of CCO documents, including all available Annual Reports, Ontario Cancer Plans, Ontario Renal Plans, and Information Strategies, as well as relevant academic publications. Collectively, these documents provided an overview of CCO’s strategic directions and foci over approximately a 15-year period. We supplemented the document review with semi-structured interviews with current and former CCO leaders (n=6) representing multiple levels of management. Participants provided verbal informed consent to take part in the interviews which were originally conducted for quality improvement and evaluation purposes. The interviews were guided by the following questions:

What key decisions and investments were made over the past 10–15 years at CCO that have had the most impact on performance? What does CCO know how to do very well? How did CCO develop and deploy its “know-how” in these areas? Where in the organization is this “know-how” located (in people, written documentation, physical systems such as databases and software programs, external partners, etc.)?

Table 1. Knowledge, capabilities, and learning: disciplines, definitions, and examples.

Concept	Discipline	Definition	Examples
Intellectual capital	Accounting; information economics	Non-tangible and non-financial assets based on knowledge, information, or experience ^{2,9}	Professional competencies and judgment; content of information systems; routines; contracts/agreements and partnerships with government, other service providers, and research institutions; organizational reputation
Organizational core competencies	Strategic management	Areas of specialized expertise that are the result of harmonizing complex streams of technology and work activity ¹⁰	Managing the continuum of care (pre-hospital, hospital, post-hospital); training physicians and internal staff on the use of information
Dynamic capabilities	Strategic management	An organization's ability to integrate, build, reconfigure, and leverage their resources and competencies to address rapidly changing environments ^{11,20}	Strategic reappraisal; environmental scanning; incremental learning; risk-taking
Knowledge management	Information sciences	Any process or practice of creating, acquiring, capturing, organizing, sustaining, applying, sharing, and renewing knowledge, wherever it resides, to enhance organizational learning and performance ^{21,22}	Repositories of information on processes and best practices; decision-support systems; web-based communities; education
Organizational learning	Organizational behavior	A process in which an organization's members actively use data and continuous cycles of action and reflection to create meaning and guide behavior in such a way as to promote the ongoing adaptation of the organization ²³	Cross-functional teams; benchmarking; appreciative inquiry; scenario planning; simulations

After this open discussion, we presented examples of IC, core competencies, and dynamic capabilities identified through the document review and asked for their feedback. The lists were modified accordingly with minor changes to word choice and presentation (i.e. combining or separating items in the lists), and the inclusion of new items. During the interviews, notes were taken by the interviewer and shared with each leader afterwards for verification as a form of "member-checking."¹⁵

Results

Literature review

Our search strategy yielded 36 seminal papers on the five concepts under examination and the theoretical foundations upon which they are based. In the literature on the healthcare sector, we identified 38 papers on IC, 4 on core competencies, and 5 on dynamic capabilities. In the sections below, we summarize the theoretical and disciplinary roots of the concepts, and describe each concept and how it has been applied in the healthcare sector. We include commentary on conceptual clarity, boundaries, and relationships.

Theoretical and disciplinary roots. Although the three concepts under discussion, and associated processes for generating and managing knowledge, emerged from distinct disciplines (Table 1), they share a common focus on knowledge resources and a common theoretical basis in the Resource-Based View of the Firm. This theory argues that an organization achieves sustainable competitive advantage from its

resources, particularly those that are valuable, rare, inimitable or imperfectly imitable, and non-substitutable.¹⁶⁻¹⁸ The Knowledge-Based View of the Firm is an extension of the Resource-Based Theory which emphasizes knowledge and learning as the critical resources, and identifies the primary rationale for the organization as the creation and application of knowledge.¹⁹

Knowledge is often defined as a context-specific combination of experience, interpretation, and reflection.²¹ Several classifications of knowledge exist which help further specify its meaning. For example, types of knowledge can be distinguished based on content, such as declarative (knowledge of what), procedural (knowledge of how), and strategic (knowledge of the context and application).²⁴ Knowledge may be explicit, that is, easy to articulate and share, or tacit.²⁵ Tacit knowledge is hard to verbalize or write down, and can often only be shared or learned through interaction and experience. Knowledge can also be characterized by where it is created or stored, whether at the individual, group/team, organizational, or inter-organizational levels, and by its uses, such as instrumental (i.e. problem-solving) or political purposes.²⁶

Below, we provide an overview of three concepts related to the content of organizational knowledge in healthcare. We present the concepts in hierarchical order with IC as the foundational concept, followed by organizational core competencies and dynamic capabilities. Figure 1 offers one approach for visualizing the interactions and relationships among these concepts and their process-oriented counterparts. Figure 1 suggests that organizational performance is a function of an organization's (a) intangible assets (*IC*); (b)

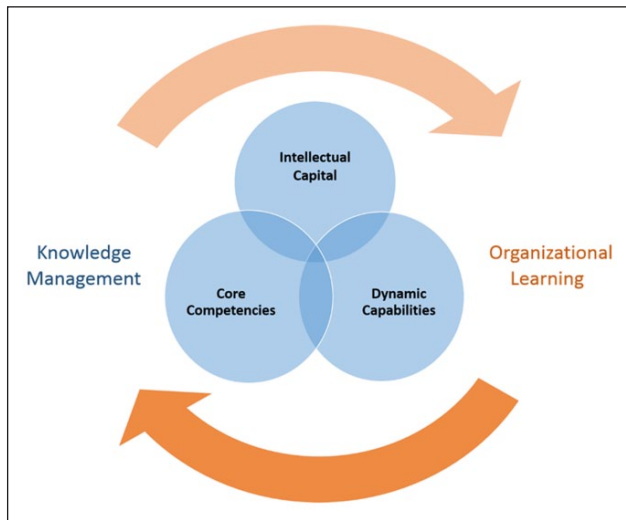


Figure 1. Conceptualizing organizational knowledge, capabilities, and learning in healthcare. Organizational performance is a function of an organization's (a) intangible assets (*intellectual capital*); (b) areas of specialized and widely shared expertise (*core competencies*); (c) ability to create, extend, or reconfigure those assets (*dynamic capabilities*); and (d) the processes and practices that shape the ebb and flow of these underlying assets and capabilities (*knowledge management* and *organizational learning*).

areas of specialized and widely shared expertise (*core competencies*); (c) ability to create, extend, or reconfigure those assets (*dynamic capabilities*); and (d) the processes and practices that shape the ebb and flow of these underlying assets and capabilities (*KM* and *OL*).

Intellectual capital. The concept of IC emerged in the early 1990s with the publication of a ground-breaking article in *Fortune* magazine by Thomas Stewart titled "Brainpower: How Intellectual Capital is Becoming Corporate America's Most Valuable Asset."⁹ The concept of IC has been defined in three ways over the years. The most broad definition is one in which IC is described as the intangible resources that organizations use for value creation and competitive advantage.⁹ IC has also been described from an accounting perspective as "goodwill" with reference to the gap between an organization's market value and its book value.²⁷ The most common definition of IC is the sum or stock of knowledge that exists in an organization at a particular point in time.²

IC is often divided into three elements: human capital, structural capital, and relational capital. Human capital refers to the knowledge, skills, and experiences owned and used by individuals.²⁸ Structural capital refers to institutionalized knowledge and codified experience stored in databases, procedures, routines, and other organizational structures, and thus owned by organizations.²⁸ Relational capital refers to the knowledge embedded within, available through, and derived from networks of relationships internal and external to the organization.²⁸ Relational capital is not owned by any

individual or organization, but it is available to organizations and individuals based on experience within the same or related networks. In other words, IC is accumulated and distributed through individuals, through organizational structures, processes, and systems, and through relationships and networks. These knowledge sources and distribution channels are not mutually exclusive.

Intellectual capital in healthcare organizations. A recent review of the literature on IC in healthcare identified 37 studies focused primarily on classifying types of IC and ranking their relative importance.²⁹ For example, Peng et al.¹³ administered questionnaires to 30 hospital managers in Taiwan to assess the importance of 59 IC assets identified via a literature review and expert consultation. The human capital category (consisting of seven assets) had the highest overall importance mean. Although the relational capital category (consisting of 20 assets) had the lowest overall importance mean, four of these assets had higher individual means than any other asset in the list of 59. The organizational (or structural) capital category consisted of 32 assets organized into four groups: healthcare services and quality, marketing, strategic management, and information technology. Other scholars highlight the importance of organizational reputation and consumer loyalty, employee know-how, organizational culture, governance structures, and clinical processes and improvement efforts.^{30,31}

The primary method used to study IC in healthcare organizations is cross-sectional questionnaires focused on managerial and clinical perceptions of IC.²⁹ In the broader literature on IC, there is more focus on the financial valuation of IC than in the literature on healthcare.²⁹ Financial valuation methods attribute a portion of an organization's value first to those assets reported on the organization's balance sheet. The remaining portion of "unexplained" value is attributed to the organization's intangible assets. The emphasis of the healthcare literature on producing high-level descriptions of IC and on measuring subjective perceptions of the value of IC suggests that additional research is needed to advance our understanding of the role and influence of IC in healthcare organizations.²⁹

Organizational core competencies. Organizational core competencies are areas of specialized expertise that cut across business units and are widely shared across the organization.¹⁰ They provide potential access to a wide variety of markets, make a significant contribution to perceived customer benefits of the end product or service, and are difficult for competitors to imitate.¹⁰ Most organizations have four to six fundamental competencies.¹⁰

Organizational core competencies may be examined based on their content and their location, or embeddedness, in the organization.¹² The knowledge and skills associated with a particular competency may be found in a variety of places. The most obvious place is in the people in the

organization, but core competencies can also be found in the following:

- Technical systems such as computer databases, equipment, and software programs;
- Written documentation such as policies, procedures, standards, and protocols;
- Education and incentive systems that support and reinforce certain types of knowledge;
- Organization's mission, culture, or values that screen and encourage certain types of knowledge.^{12,32}

These repositories have been referred to as “knowledge reservoirs” which serve as channels for knowledge transfer, as well as platforms for forming unique bundles of knowledge.^{1,3} All core competencies fall somewhere on the continuum between being completely mobile, such as when they are embedded in people only, and being completely embedded, such as when they are integrated into the organization's culture.¹²

Organizational core competencies in healthcare organizations. Despite the prevalence of core competency frameworks for healthcare professionals and leaders, little work has been done in health services research on identifying and managing *organizational* core competencies. For example, Goldberg and Bryant³³ describe and assess capacity-building in healthcare organizations by referring to organizational core competencies such as financial management, leadership, technical capabilities, and human resources management. Similarly, in a paper on driving rapid change in healthcare, Caldwell³⁴ highlights the ability to replicate best practices and success from one team or unit to another as an organizational core competency. In these examples, however, the term is used loosely, with minimal or no reference to the broader conceptual and theoretical literature on organizational core competencies. A notable exception is a study by King and Zeithaml,^{12,35} in which 30 organizational core competencies were identified and ranked through interviews and a questionnaire with 96 top and middle managers in eight community hospitals in North Carolina. Seven categories of organizational core competencies were identified in the following areas: managing human resources, clinical specialty capabilities, managing managed care, managing external stakeholders, information systems capabilities, facilitating innovative market extensions, and managing patient perceptions of care. The three competencies most highly valued by top and middle managers were as follows: (1) knowledge, skills, and experience in containing costs; (2) succeeding in an environment of managed care; and (3) maintaining a patient-friendly environment.³⁵

The concept of “embedded” core competencies is very similar to the tripartite IC framework described above (human, structural, and relational). However, we propose that four factors differentiate IC from organizational core competencies.

First, IC explicitly includes relational capital and the argument that knowledge can also be accessed and brought in through external stakeholders and partners. Through a core competency lens, however, the focus is on knowledge held within the organization; for example, an organization may have a core competency in managing external relationships (e.g. how to interact with customers, regulators, and payers). Second, IC includes other important intangible assets that are not necessarily knowledge-based, including organizational reputation, brand, image, and client loyalty. The studies by King and Zeithaml^{12,35} on organizational core competencies, described above, do incorporate consideration for external stakeholders (patients) and their perceptions (organizational reputation). However, there is a subtle, but crucial difference in the significance ascribed to external stakeholders by the concept of organizational core competencies versus the concept of IC. King and Zeithaml,^{12,35} for example, identify management of patients, and their experiences and perceptions, as hospital core competencies. From this perspective, healthcare organizations use their internal knowledge and capabilities to shape patient perspectives from the “inside-out.” By contrast, the IC framework identifies patients and other external stakeholders as sources of knowledge and similar intangible resources. From this perspective, knowledge is accessed externally and brought into the organization (“outside-in”). Another differentiating factor between the two concepts, particularly in the broader field of business management, is that the body of work on IC tends to focus more on measuring and valuing knowledge resources, while the body of work on core competencies tends to focus on understanding and nurturing these resources. Both perspectives are useful. Finally, in comparison with IC, organizational core competencies are higher order capabilities derived from the organization's tangible resources and IC. For example, an organization may collect and analyze patient experience data from surveys, focus groups, and patient involvement in hospital committees. This information provides IC that can be translated into revised policies, and changes in staff training and performance assessment to contribute to a core competency of patient-centered care. In summary, we can distinguish between intangible assets themselves (IC) where they are stored or embedded (knowledge reservoirs), and the ways in which they are combined to form areas of specialized expertise (organizational core competencies).

Dynamic capabilities. An organization's capabilities refer to its capacity to perform a coordinated set of tasks, utilizing organizational resources, to achieve particular results.³⁶ Capabilities are based on routines, that is, the way things are usually done in an organization. Dynamic capabilities are a special class of capabilities concerned with change and innovation. Dynamic capabilities help explain how organizations enhance and sustain performance in rapidly changing environments by creating, extending, or modifying their resource base through investment and other managerial interventions.^{11,20} Dynamic capabilities have also been conceptualized as flexibility and

adaptability of resources and routines.³⁷ The dynamic capability theory argues that organizations must be both stable enough to continue delivering value in their own way and resilient enough to shift when circumstances demand it.¹¹

Drawing on empirical findings, Wang and Ahmed³⁸ identify three types of dynamic capabilities: (1) the *adaptive capability* to identify and capitalize on emerging opportunities, (2) the *absorptive capability* to take in external knowledge and combine it with internal knowledge, (these two components have been conceptualized and widely referred to as “absorptive capacity”³⁹), and (3) the *innovative capability* to develop new products, services, or ways of working. An explicit focus on change and innovation separates dynamic capabilities from the broader concept of KM. KM is concerned with processes and practices aimed not only at creating or modifying knowledge (similar to dynamic capabilities), but also at maintaining and managing existing knowledge. In general, dynamic capabilities enable the development and/or reconfiguration of underlying IC resources and organizational core competencies. As such, dynamic capabilities encapsulate both explicit processes and knowledge content embedded in the processes.³⁸

Dynamic capabilities in healthcare organizations. In a study of strategic management and performance differences across nonprofit and for-profit healthcare organizations, Reeves and Ford¹⁴ examined a range of dynamic capabilities, including strategic reappraisal (extent to which the organization rethinks its strategies and the way in which it will achieve its strategies), risk taking (the extent to which top managers are risk averse or willing to make changes based on intuitive assumptions or where failure is probable), multiplexity of decision-making (range of factors considered by top managers when making strategic decisions), and scanning (amount of tracking and number of organizational members scanning the environment in terms of consumer issues and administrative developments), among others. Other scholars focus primarily on learning as a dynamic capability. For example, Salge and Vera⁴⁰ identify incremental learning as a dynamic capability consisting of three routines, namely, organizational and managerial encouragement to detect problems, suggest ideas, and participate in change. Their longitudinal study found a significant positive relationship between incremental learning and risk-adjusted patient survival across 153 hospitals in England. Similarly, Pablo et al.⁴¹ conducted a case study of how the Calgary Health Region in Canada used “learning through experimenting” as a dynamic capability to cope with and address decreased financial resources and increased demand for quality primary healthcare services. Other studies examine the role of dynamic capabilities in innovation implementation in healthcare, such as in the development of health information exchanges⁴² and chest pain units.⁴³ These studies also emphasize the importance to dynamic capabilities of underlying learning and decision-making routines.

Knowledge management and organizational learning: process-oriented perspectives. The purpose of KM as a field is how to

better utilize the knowledge contained in an organization to enhance OL and performance.^{21,22} The focus of KM is usually on codifying knowledge in information systems and information technologies, such as electronic libraries, data-mining tools, and computerized decision support systems. However, KM is also a social process in which knowledge can flow (or not) between individuals through their interactions.⁶ In the KM literature on healthcare, the focus tends to be on the development and use of professional networks, education and training programs, and other social processes to assist KM initiatives.^{6,44} Although the process of knowledge transfer is subsumed under KM, in healthcare, the term “knowledge transfer” refers specifically to moving research evidence into routine practice.⁶ OL refers to a change in an organization’s knowledge base as a function of experience.²³ OL occurs as members actively use performance data and continuous cycles of action and reflection,²³ and it can manifest through changes in cognitions, routines, and/or behaviors.⁴⁵

The relationship between OL and KM can be conceptualized in a variety of ways. The terms OL and KM are sometimes used in tandem or interchangeably in recognition of their overlap.⁴⁶ For example, KM may be viewed as an aspect of OL.^{47,48} However, several scholars argue that the overarching goal of KM is to facilitate the processes of reflection and adaptation that constitute OL.^{20,22,23} This view implies that KM is an input and OL an output. Easterby-Smith and Lyles⁴⁵ choose to differentiate between the two by suggesting that KM has a more micro-level focus than OL. KM is also more deliberate in nature than OL. OL may be facilitated by management interventions, but it can also occur passively over time.⁴⁹ KM, however, is predicated on explicit interventions of some kind (e.g. tools, systems, and social strategies).⁵ The nature of the knowledge in question may influence whether KM or OL is used or should be used; explicit knowledge can be harnessed using KM tools, while tacit knowledge may be best managed using OL processes and tacit methods of knowledge exchange such as mentoring and communities of practice.

Given the complex and dynamic nature of organizational knowledge, capabilities, and learning, these competing views each have merit. Nevertheless, their definitions and foci suggest that OL and KM are more process-oriented than IC, core competencies, and dynamic capabilities, which are more content-oriented. As such, in Figure 1, we conceptualize OL and KM as overarching processes that drive the development of IC, core competencies, and dynamic capabilities. These diverse concepts and their associated bodies of work demonstrate that knowledge is a resource that individuals and organizations *have*, and that learning is an active process that individuals and organizations *do*.⁵⁰

Case study on Cancer Care Ontario

CCO is the provincial agency responsible for improving cancer services. CCO also established and houses the Ontario Renal Network and the Ontario government’s Access to Care program, which supports the province’s Wait Times Strategy.

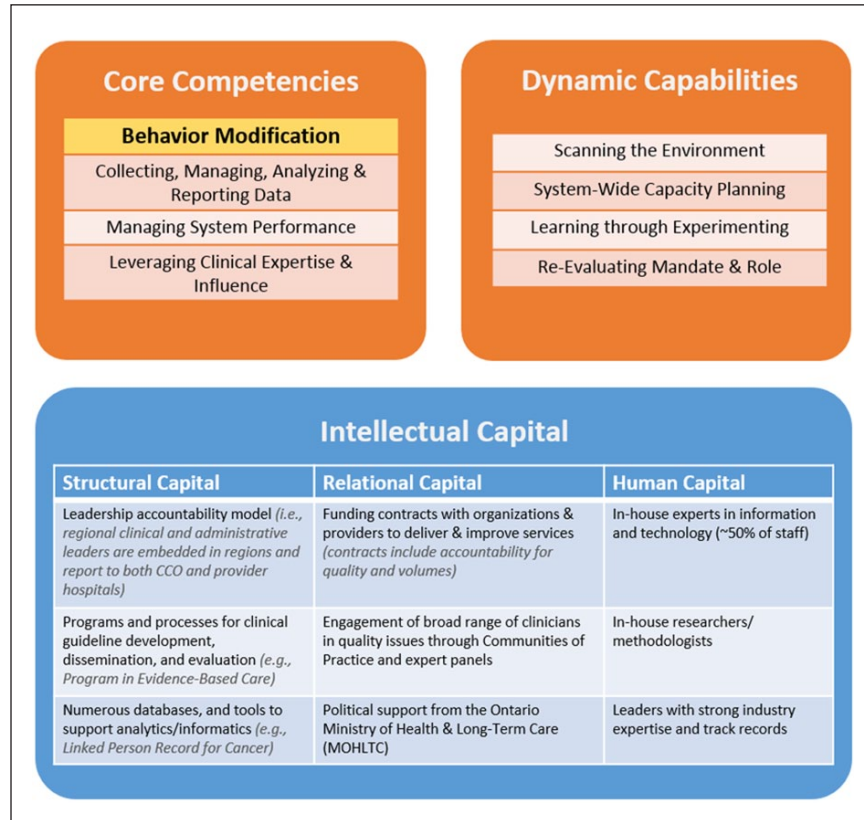


Figure 2. Exploration of Cancer Care Ontario’s organizational knowledge and capabilities.

As such, CCO has a complex mandate involving multi-year system planning, contracting for services with hospitals and providers, developing and deploying information systems, establishing guidelines and standards, and tracking performance targets to ensure system-wide improvements in cancer, chronic kidney disease, and access to care.

Through document review and interviews, we identified CCO’s core competencies, dynamic capabilities, and IC. The results are presented in Figure 2. Over the years, CCO has become adept at modifying the behaviors of organizations and professionals in the healthcare system to drive improvement. This core competency is supported by expertise in collecting, managing, analyzing, and reporting data; managing system performance using a variety of strategies, such as funding contracts, scorecards, targets, performance reviews, and public reporting; and leveraging the expertise and influence of clinicians. One example of CCO’s work in behavior change is the provincial implementation of the Edmonton Symptom Assessment System (ESAS), a standardized screening tool that gathers information directly from patients about their symptoms.⁵¹ Using an electronic platform known as Interactive Symptom Assessment and Collection (ISAAC), patients report their symptoms via kiosks or tablets directly to clinicians in real time from hospitals, clinics, or home. Symptom assessment guides and algorithms were also deployed to support clinicians in interpreting ESAS

scores and managing their patients’ symptoms. To drive behavior change, CCO engaged clinical leaders and champions in the planning and implementation process, mandated the implementation of ESAS in their contracts with Regional Cancer Programs, added ESAS screening rates to their Regional Performance Scorecard with the target that 70% of patients should be screened using ESAS at least once per month, and publicly reported ESAS screening rates. CCO’s implementation of ESAS resulted in positive clinician and patient feedback,⁵² and the creation of the largest symptom database in the world consisting of 3.4 million ESAS screens since 2007. Use of ESAS is now a part of routine practice in Ontario’s cancer system, and CCO is currently piloting a modified version of the tool in the renal system.

CCO’s dynamic capabilities enable the organization to innovate and evolve as environmental pressures change; the most compelling example of this is the expansion of CCO’s mandate to include chronic kidney disease and access to care for key healthcare services. CCO’s transition from an organization focused exclusively on cancer to one focused more broadly on chronic disease management is reflected in the organization’s vision, “Working together to create the best health systems in the world.” Underlying CCO’s core competencies and dynamic capabilities are nine major sources of IC, organized into three categories: structural, relational, and human (Figure 2).

In alignment with the literature review, the case study reinforces the argument that the three concepts—core competencies, dynamic capabilities, and IC—are distinct, but related. For example, CCO’s core competency in “Collecting, Managing, Analyzing, and Reporting Data” is supported by over 500 staff members with expertise in information and technology (human capital), and CCO’s extensive databases and informatics tools (structural capital). This core competency and its underlying IC also drive the organization’s dynamic capability in “System-Wide Capacity Planning” which involves forecasting future needs for equipment and service delivery. Another example is with regard to CCO’s core competency in “Managing System Performance,” which is supported by the data and evidence it generates (structural capital), and the contractual funding and accountability levers it holds (structural and relationship capital). The mutually reinforcing relationships in knowledge content across the three concepts demonstrate that CCO’s organizational knowledge is broadly embedded in the organization, in databases, documents, accountability structures, employees, external partnerships, and a culture of evidence-based improvement. This pattern of embeddedness is advantageous for building and retaining organizational memory.³

However, the interviews also highlighted some of the challenges CCO faces in managing its knowledge. Staff turn-over, contractual project-based hires, and one-time funding for initiatives may result in the loss of new knowledge and experience before it is embedded in the organization. Employee surveys have also revealed a need to invest in ongoing education and training. The involvement of external researchers and clinicians in CCO projects requires explicit attention to the issue of who owns the intellectual property generated through new initiatives, expert panels, and research. Finally, with the expansion of CCO’s vision and mandate beyond cancer, the need to partner with other organizations to leverage each other’s knowledge is apparent, but may be contested by trust and turf issues. All of these challenges point to a need for CCO to continue developing its human and relational capital. Since the interviews were conducted, the organization has invested in employee development, emphasized sustainability as an important consideration in the implementation of new initiatives, and identified strategic partnership management as an area of ongoing improvement.

Discussion and conclusion

IC, organizational core competencies, and dynamic capabilities are three related concepts that challenge researchers and decision-makers to identify, understand, and improve the underlying intangible resources and capabilities that drive performance in healthcare organizations. While the concept of IC tends to focus on measuring and valuing these resources, the bodies of work on organizational core competencies and dynamic capabilities emphasize the importance of developing these resources and capabilities, albeit with different aims. The aim of understanding and nurturing

organizational core competencies is to support day-to-day operations and the optimization of existing processes. However, the aim of understanding and nurturing dynamic capabilities is to facilitate organizational change and innovation. All three foci have relevance to healthcare organizations, which are under increasing pressure to improve quality of care and the patient experience while containing costs in the context of shifting socio-economic, political, and regulatory environments. However, to date, efforts to identify, understand, and improve organizational knowledge have been limited in health services research. Our discussion of research on these three concepts reveals that they are not widely applied in healthcare contexts. Among the limited existing studies, the focus tends to be on generic, high-level, or cursory examinations of organizational knowledge (e.g. 28, 31), or in-depth explorations of a specific type of organizational knowledge (e.g. 39), rather than a comprehensive and nuanced analysis of a range of knowledge resources and their interactions. In fact, Ferlie et al.⁴ argue that the performance-oriented perspective of the resource-based view of the firm has not yet been applied in healthcare (p. 1297).

The conceptual comparison and case study presented here suggest that a more nuanced examination of organizational knowledge in healthcare organizations involves not only identifying knowledge resources but also asking the following questions: (1) What is the content of each resource? (2) Where in the organization is the resource embedded? (3) How did it develop? and (4) How is it currently used? This line of questioning may offer new insights on resource allocation and investment, as well as mechanisms of change in healthcare organizations. An understanding of organizational knowledge can also help inform what performance indicators an organization should be monitoring, using a balanced scorecard (BSC), for example. The BSC focuses attention on balancing financial and non-financial indicators across four quadrants: learning and growth, internal processes, patient outcomes, and financial outcomes.⁵³ The BSC’s “learning and growth” quadrant often includes human capital indicators, the “internal processes” quadrant is well-aligned with structural capital, and the “patient outcomes” quadrant captures one aspect of relational capital. Understanding what are the necessary core competencies for optimizing particular healthcare delivery models, programs or organizations could help focus the development of both IC resources and dynamic capabilities. Unpacking organizational knowledge in this way will also complement the growing bodies of research on OL and KM (including knowledge transfer) in healthcare organizations.

This study is subjected to limitations, some of which highlight opportunities for future research. First, the literature review focused on three concepts: IC, core competencies, and dynamic capabilities. Other similar concepts or terms used in the literature on organizational knowledge and capabilities may have been missed. Furthermore, although the paper acknowledges KM and OL, a systematic search for healthcare papers on these topics was not conducted. Finally, only six interviews were completed for the CCO

case study, so the results may not be representative of the varied types of organizational knowledge content and challenges experienced by the organization. However, key themes across the six interviews were highly consistent, suggesting that we were at or near data saturation,¹⁵ and the interviews were supplemented by a comprehensive review of available documents.

The contribution to healthcare management of the conceptual discussion presented here is that it unites disparate fields of inquiry, based on resource- and knowledge-based perspectives, into a broader taxonomy of determinants of organizational performance. Thinking about IC, organizational core competencies, and dynamic capabilities as overlapping and complementary concepts (as depicted in Figure 1) enables us to compare and potentially combine evidence across historically disassociated domains, while recognizing important differences in the questions and issues that each concept emphasizes. The results presented also suggest that we know little about how to identify, describe, and measure organizational knowledge in healthcare. Additional research in healthcare settings is needed to enhance understanding of the content and influence of IC, organizational core competencies, and dynamic capabilities, and associated management strategies. To unpack and explore these forms of organizational knowledge, an in-depth understanding of the organizational context is necessary. Longitudinal, comparative case-study research focused on identifying and unpacking organizational knowledge across multiple healthcare organizations or programs may provide new insights into the nature of organizational knowledge, how it is used or not used, and how it evolves or not over time.

An understanding of existing organizational knowledge and capabilities, and a systematic approach to managing and measuring these resources, can also help organizational leaders (1) ensure that relevant knowledge, evidence, and data are available to all staff, (2) make full use of an organization's knowledge for patient care and service improvement, and (3) develop strategies to protect organizational knowledge during times of major change. Furthermore, broader policy changes aimed at enhancing access, quality of care, and/or service integration require the recognition and use of knowledge and capabilities from *across* the healthcare system. Such large-scale system transformation is challenged by major divisions between clinical and managerial knowledge, and between acute care and community care knowledge. More attention to identifying, describing, and measuring organizational knowledge using the concepts presented here may help system-level leaders and policy-makers coordinate and leverage the respective strengths of various healthcare sectors and organizations to achieve improvement.

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Ethical approval

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Informed consent

Participants provided verbal informed consent to participate in the interviews, which were not recorded.

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