

Knowledge Management Competencies in Health and Social Care

Harri Laihonen and Kaija Saranto

University of Eastern Finland, Kuopio, Finland

harri.laihonen@uef.fi

kaija.saranto@uef.fi

Abstract: Knowledge management literature has thoroughly discussed the aims and objectives of managing knowledge, recognized critical success factors of knowledge processes, analyzed knowledge creation, transfer and sharing, and even some indications of the effects of knowledge management have been evidenced. However, despite skills, competences, and employees' knowledge and experience are among the recognized success factors, discussions on competence needs of effective knowledge management are lacking. To contribute to this knowledge gap, this article studies knowledge management competences with an aim to elaborate this critical component of organizational performance and renewal. The special focus of the article is on the management of health and social care and the article brings together two distinct disciplines, knowledge management and health informatics, to suggest a novel way to approach KM capabilities and competences in the given context. Based on the literature and empirical data gathered with two surveys targeted to health informatics and knowledge management practitioners in health and social care the article concludes that: 1) It is difficult to separate the discussion on competence needs from the discussions concerning the information content and tools of data management. The latter aspects dominate the debate and determine and limit in many ways the discussions on knowledge management, its nature, content, and people participating to these discussions, and 2) knowledge management in health and social care focuses extensively on issues of data management and decision-making support.

Keywords: health and social care; competences; capabilities; knowledge management; health informatics

1. Introduction

Knowledge management (KM) is a management paradigm of the knowledge society. The roots of KM are in strategic management literature and in knowledge-based view of a firm (Grant, 1996; Spender, 1996). The overall aim of KM is to attain sustainable competitive advantage and strategic KM connects an organization's business strategy to the required knowledge assets (Hansen et al, 1999; Zack, 1999). In the public sector, the objectives of KM are more diverse, and it aims to enhance decision-making in public services, aid the public to participate in public decision-making, build societal capabilities, and develop competitive work force (Wiig, 2002).

In Finland, a reform of healthcare, social welfare, and rescue services is under way. The responsibility for organizing these services will be transferred from municipalities to wellbeing services counties from 2023. The key objective of the reform is to improve the availability and quality of basic public services throughout Finland (see <https://soteuudistus.fi/en/frontpage>). This reform focuses not only to re-defined geographical regions to provide services but also to means of providing services, and especially, the role and support of digitalization. The reform provides a context for this study, and the central questions for KM are: how can KM support serving of public good and good governance, and what kind of competences and skills are needed to fulfil these tasks? The focus of this article is on the latter question.

KM literature has quite thoroughly discussed the aims and objectives of KM, recognized critical success factors of KM (Heisig, 2009), analyzed processes of knowledge creation (e.g., Nonaka & Takeuchi, 1995), transfer (e.g., Argote & Ingram, 2000) and sharing (e.g., Riege, 2005), and even some indications of the effects of KM have been evidenced (e.g., Heisig et al, 2016; Inkinen, 2016; Hujala & Laihonen, 2021). However, despite skills, competences, and employees' knowledge and experience are among the recognized success factors, discussions on the evolving competence needs of effective knowledge management are lacking. To contribute to this knowledge gap, this article studies KM capabilities and competences and elaborates this critical aspect of KM with an aim to better understand what competences are needed to support organizational performance and renewal. In this article we complement the organizational focused view of KM with health informatics (HI) literature, which offers various frameworks for mapping HI competences (e.g., Jidkov et al, 2019; Thye et al, 2020). The article answers to the following research questions: 1) what is meant by KM competences and skills, and 2) what are the competence needs related to KM in management of health and social care?

2. Theoretical background – KM competences in health and social care

2.1 KM capabilities and the management of health and social care

There are different ways to approach KM capabilities and competences. Typically, these are approached from an organization-centric standpoint (cf. Laihonen & Huhtamäki, 2021) and the focus is on the management of processes, services, organizations, or institutions. Gold et al (2001) developed an organizational capabilities perspective, which aimed to identify and assess the preconditions – capabilities – for KM to flourish in organizations. Authors categorize capabilities into infrastructures and processes. Infrastructure capabilities are further divided into technical, structural, and cultural capabilities. KM processes leverage infrastructure to collect, store, transform and transport knowledge throughout the organization, and authors named four dimensions of process capability – acquiring knowledge, converting it into useful form, applying or using it, and protecting it. The chosen focus on the organizational capabilities leaves individual’s skills and competences mostly out of the equation. Alavi and Leidner (2001) consider ‘capability’ as one perspective to knowledge, which considers knowledge as ‘the potential to influence action’ or ‘the capacity to use information’ as Watson (1999) suggests. Different views to knowledge lead to different perceptions of KM, and the view of knowledge as a capability suggests that KM is centered on building core competencies, understanding the strategic advantage of know-how, and creating intellectual capital (Alavi & Leidner, 2001). KM capabilities can also be viewed from the viewpoint of knowledge assets or intellectual capital (IC). IC management categorizes knowledge assets into structural, relational, and human capital (cf. Edvinsson & Malone, 1997; Sveiby, 1997; Roos et al, 1997), which is less studied aspect in public sector (cf. Guthrie & Dumay, 2015) and in the contexts of healthcare (cf. Evans, Brown & Baker, 2015) or social care (cf. Sillanpää et al, 2010).

Taking the discussion to the context of health and social care means that we need to acknowledge that capabilities and competences vary at different levels of the service system (see Figure 1). Naturally, competence needs vary also between professions. Technological innovations, scarcity of resources and increasing expectations and needs of customers and citizens are important change drivers throughout the society and have an impact also on knowledge needs and competence requirements at all levels of the service system. Indeed, in health and social care, KM is not only about streamlining information processes but also about coordinating multi-professional and intersectoral collaboration that introduce different values, objectives, and control mechanisms (Laihonen & Kokko, 2020) necessitating continuous performance dialogue (Laihonen & Mäntylä, 2017; Rajala & Laihonen, 2019). Approaches focusing only on rationality of decision-making and operational efficiency may neglect the social aspects of KM and the overall benefits of KM may become unachievable (cf. Hujala & Laihonen, 2021).

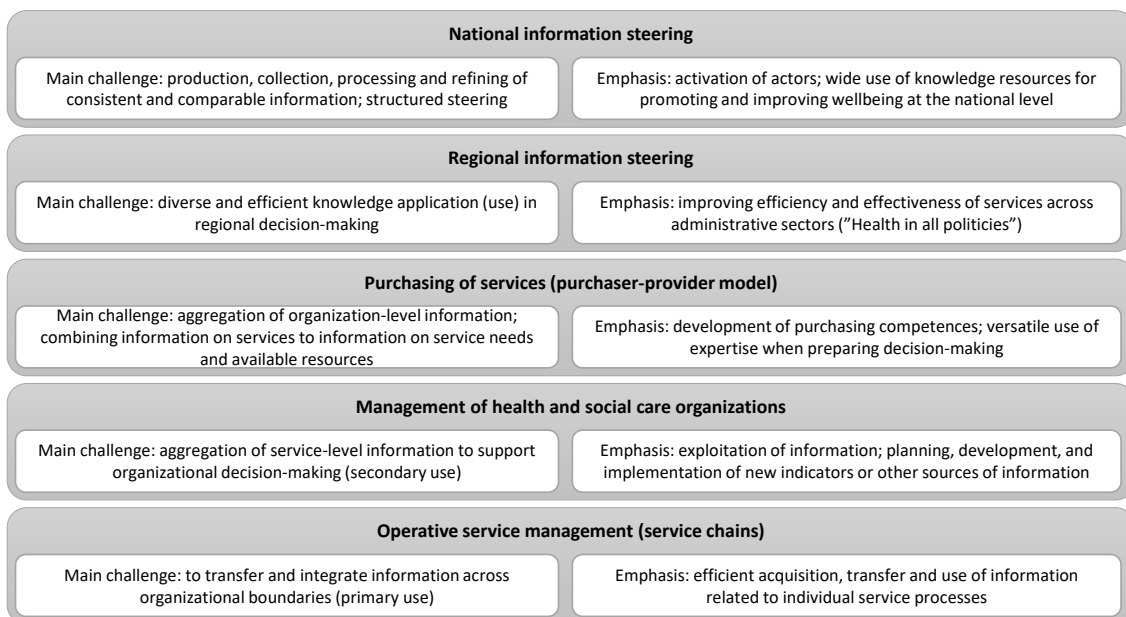


Figure 1: Data, information and knowledge are created and used at different levels of the service system (modified and summarized from Laihonen 2012; 2015)

Ongoing digital transformation and increasing connectedness of societal sectors and actors link the future competence needs not only to technological development but also to ways how organizations and organizing are perceived (cf. Laihonen & Huhtamäki, 2020). Hierarchical structures and management models take very different view to openness and to sharing and use of knowledge compared to those models that underscore the self-organizing nature of knowledge work (cf. Laihonen, 2006; Lönnqvist & Laihonen, 2017). Therefore, while considering the institutional and organizational context of KM, it is also important to pay careful attention to the special nature of health and social care data and its secondary use. Therefore, to complement the strategic and organizational viewpoint to managing knowledge, there is a need to acknowledge the developments in health informatics where the competence needs have been more explicitly discussed.

2.2 Health informatics competencies in health and social care

Different concepts are used for referring to competences needed to support the transition from the paper to the digital world in healthcare. Thye et al (2018) study eHealth competencies, Jidkov et al (2019) assess health informatics training in UK, and Thye et al (2020) approach the same topic by analyzing professionalism of information management in healthcare. All these approaches share the aim to understand and develop competences that would help organizations to respond to increasing digitalization in healthcare. This aim builds on an idea that a professional information management is required to successfully plan, implement, and evaluate information technology, and to ensure a high quality of health data and health information systems to support patient care (Thye et al, 2020). In addition to these academic contributions to the discussion, the European Federation for Medical Informatics (EFMI, see <https://www.efmi.org>), and the International Medical Informatics Association (IMIA, see <https://imia-medinfo.org/wp/>), have enhanced multidisciplinary education of professionals working in health care (Thye, 2020).

IMIA recommendations for Biomedical and Health Informatics Education were launched in 1999 and in spring 2022 the second updated version was published to guide not only academic institutions but also service providers and developers to reach optimum level of competencies in digitalized work environments. According to the IMIA, as of spring 2022, there were 31 academic institutions providing health and biomedical informatics education. IMIA recommendations have also been applied in several academic studies to map HI competences. For example, Jidkov et al (2019) developed a framework of 50 HI competencies in postgraduate medical education and training. These competences were categorized into six domains. The domain of 'Information and Knowledge Management' covers three themes: 1) understanding the properties of different media, 2) decision support – finding and recording sources of information digitality, and 3) secondary use of data. The third domain contains three sub-categories: nuances of digital data recording, e.g. use of terminologies and nomenclatures, for high quality data capture; accessing and using digitally recording data for research and audit; data analyses (Jidkov et al, 2019). In Finland, which is the context of this study, the IMIA recommendations have guided the establishment of the master's degree programme in health and human services informatics (HHSI) at the University of Eastern Finland (UEF) in 2000 (Saranto et al, 2017). The discipline has its origin in the implementation of digital technologies in health and social sciences (Saranto & Kinnunen, 2021). As an interdisciplinary programme, HHSI applies data, implementation, information, and management sciences to study the role of information technology in health and social care. HHSI is understood as the management of information resources covering data, actions, actors, and technology in the production of health and social care (Saranto et al, 2017). As the only interdisciplinary program in Finland authorities, service providers, and system developers have taken advantage of graduates' knowledge and skills by recruiting them for various positions all over the sector (Kinnunen & Saranto, 2018).

Another way to approach KM and HI competences is provided by Choo (2002) whose information management cycle enables the categorization of the needed competences according to the information value chain. This value chain begins with the identification of information needs, moves on through information acquisition, organization, and storage, products and services, distribution, and closes with information use. As pointed out in the previous section, in a health and social care system multiple information management cycles become intertwined and it is essential to understand that information needs of different actors at different levels of the system vary depending on their role and accountabilities. This urges for a user-centered perspective of KM that is aware of the contingencies. Often it is not enough to know what the users want to know, but also why a certain knowledge need is raised and how the users will use the information (cf. Choo, 2002).

3. Empirical examination – KM competences in health and social care

3.1 Methods and data

Two surveys were used to map the competence needs of practitioners. The first survey targeted for KM specialists in health and social care was implemented in April 2021. Respondents (18/55, response rate 32%) participated into an online seminar dealing with timely issues of KM and effectiveness of health and social care. In addition to background questions, the survey had five open-ended questions and 10 items measuring the success of national-level information steering, fluency of regional collaboration, and the prevailing level of KM competences. Based on the learnings of the first survey, a second survey was constructed to map the level of KM competences by following Choo’s (2002) information management cycle, which is a common point of reference both in KM and health informatics literature. The second survey had four categories of questions: 1) service system governance and management (information needs), 2) data production (information acquisition), 3) data storage and analyses (information organization and storage), and 4) knowledge sharing and application (information distribution and use). Each category contained 6-8 statements that respondents evaluated on the scale of 1 (weak) to 5 (very good). In addition, they were asked to provide an overall grade for each competence categories on the scale of 4-10. The second survey was shared in a national conference on ICT in social and healthcare in May 2021. Later, a link to the survey was shared also in national networks of “KM in health and social care” and “IT management in health and social care”. The second survey received 29 responses. The results of the surveys are summarized in the following paragraph.

3.2 KM competences in health and social care

The first survey brought up respondents’ views on KM competences from various perspectives. They underscored the importance of technical understanding related to the possibilities of modern information systems as well as the ability to picture the system-level possibilities for renewal. A clear need for connecting KM to the context was perceived. This means that development of KM must be tightly connected to the practice of health and social care. Also, common performance indicators were called for. Lack of resources both in terms of quality and quantity was reported. More specific competence needs related, for example, to data protection, information security, and responsibilities of registrars. Further, information systems, analytics, and artificial intelligence were listed as technical competences that health and social care organizations are in a need of.

The respondents recognized that an emphasis of KM is in healthcare although social care depicts a large part of the integrated service system. Some respondents stated that a shortage of skills and competences is an attitude problem, which leads to sub-optimizing behavior, and often at the expense of social care. The survey was implemented in the middle of a major reform of health and social care services, and therefore, some respondents found it difficult to estimate the status of KM competences and imagine how the competence needs would evolve in the near future. Also, respondents recognized major differences between the different organizations and geographical areas. Critics were targeted at national-level information steering, and it was stated that clear objectives are needed to guide the development of KM. The shortage of skills was recognized regarding legislation, data lakes, and data-analytics. Also, management skills in information use are lacking. Figure 2 summarizes the level of KM competences in four areas on the scale of 1 (weak) – 5 (very good): technical competences (mean 2,7), knowledge production (mean 3,2), analysis (mean 2,8), and knowledge application/use (mean 2,4).

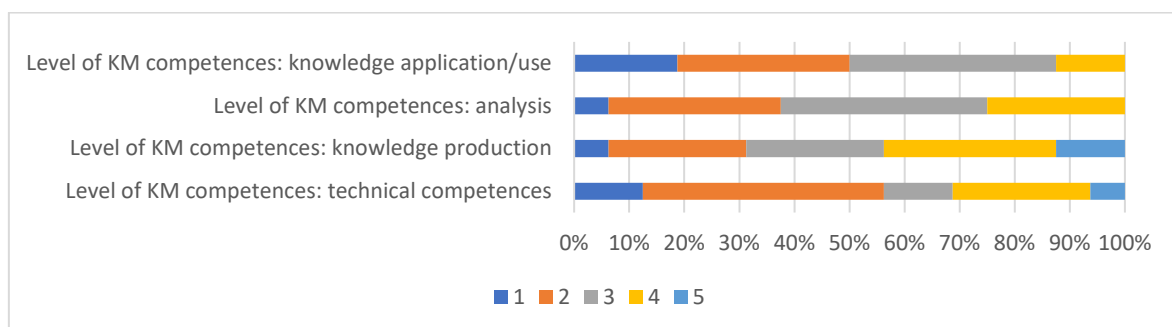


Figure 2: Level of KM competences in four areas (n=17)

Next, the main results of the second survey are shortly summarized (n=29). *Service system governance and management*. An average for this category was 3,2. Respondents found that competences were strongest in the

areas of data privacy and information security (mean 3,8) and in recognizing customer needs (mean 3,5). The weakest areas were forecasting (mean 2,8) and recognition of managerial knowledge needs (mean 2,9). Only slightly better areas were competences related to knowledge in strategic management and operations management. The poor results in the latter category may relate to the ongoing reform and unclear objectives.

Data production. An average for this category was 3,2. Respondents found that competences were strongest in the areas of use of customer and patient information systems (mean 3,6), commitment to data production (mean 3,4) and structured documentation (mean 3,3). A lot of development work has taken place in these areas in Finland during the last years, which may explain the good results. The weakest ratings in this category were reporting of comparative information (mean 2,8), governance of operations data (mean 2,9), and evaluation of data quality (mean 3,0). Rating of these areas was difficult because the new wellbeing services counties were not established yet. However, these results may be valuable when planning the future education and development needs in new organizational entities.

Data storage and analyses. An average for this category was 3,0. Data storage (mean 3,6), data integration (mean 3,2), and data analysis (mean 3,0) were the strongest competence areas in this category. Majority of the respondents represented information technology and information systems specialists, which may explain the results. Weakest areas were future technologies (mean 2,5), data visualization (mean 2,7), and recognition and use technology platforms (mean 2,8), which pinpoints a clear need for training in these innovative areas of KM.

Knowledge sharing and application. An average for this category was 2,6. The strongest competences were in using information in operations and financial management (mean 3,1), knowledge sharing across sectoral boundaries (mean 2,8), and using information in operations management (mean 2,8). Overall, competences in this category received the weakest evaluations. This is an important observation because these competences have a significant role in regional information steering and knowledge-based decision-making. Ecosystem-thinking (mean 2,2), benefiting from comparative information (mean 2,4) and use of information in multi-professional collaboration and decision-making (mean 2,5) received the weakest evaluations.

4. Discussion and concluding remarks

The article aimed to better understand what is meant by KM capabilities and competences and what are the competence needs related to KM in the management of health and social care. The article brought together two distinct disciplines, knowledge management and health informatics and provided various ways to approach KM capabilities and competences. It seems that KM literature has mostly applied an organizational perspective to KM capabilities (e.g. Gold et al, 2001) and KM competences have not been very thoroughly discussed. However, the importance of individual capacity and competences can be detected in definitions where knowledge is considered as a capacity to use information (Watson, 1999) or the potential to influence action (Alavi & Leidner, 2001). Indeed, this view underscores Grant's (1996) ideas of knowledge-based view stating that "knowledge resides within the individual and the role of the organization is knowledge application rather than knowledge creation". This also highlights the importance of knowledge assets and society's intellectual capital (cf. Wiig, 2002; Laihonen & Mäntylä, 2018) when the discussion turns into public services, and especially management of health and social care. KM in this context should not be reduced only to streamlining of reporting and decision-making processes, nor solving tame organizational problems (Dumay, 2020).

Health informatics research on the other hand has quite extensively studied and developed frameworks for mapping HI competences (e.g., Jidkov et al, 2019; Thye et al, 2020). Also, international actors like EFMI and IMIA have been active in promoting international standards. Whereas the KM discipline originates from the strategic management literature, health informatics research has its roots in health sciences and information management (cf. Kinnunen & Saranto, 2021). This orientation sets a different tone and focus for studying KM competences as shown for example by Thye et al (2020) and Jidkov et al (2019). Here the focus is on creating future-proof training for doctors and other health specialists, and in producing even more effective physicians for the future as Jidkov et al state.

Clearly, it would be ideal that the clinical and information management focused views would be complemented with the strategic and organizational perspectives of KM research, and taken into the practice in strategic, tactical, and operational management of health and social care (cf. Thye et al, 2020). Now however, Thye et al (2020) report severe deficits in the areas of tactical and strategic information management. According to authors

this may be due to a lack of priority, competencies, or resources. The results of this study support the findings of Thye et al, 2020. KM competences were strongest in technical areas related to the different phases of the information management cycle and the weaker areas were found in knowledge application, system-level governance, and in strategic management.

This article opened a discussion on KM competences in the specific context of health and social care, which is a multidimensional context for KM necessitating a thorough understanding of the context as well as a careful consideration of the varying competence needs of different professions at different levels of the service system. Distinct roles and responsibilities set different requirements and needs for KM competences. Therefore, it is difficult to see that there could be only one job description that would cover all the various aspects of KM in health and social care. Further, it is important to acknowledge that the need for KM competences evolve as a part of societal change. Especially in a sector like health and social care these competences are connected to a wider discussion on organizational capabilities and society's intellectual capital (cf. Wiig, 2002). Three main findings can be made.

First, many of the so-called KM competences can be considered as basic skills for the future. For example, the World Economic Forum (WEF) regularly lists skills that are needed in the future work life. In their list of top 10 skills of 2025, competences like analytical thinking and innovation, active learning, and complex problem-solving are highlighted. For sure, these are mandatory skills also for KM. The list continues with critical thinking and analysis, creativity, originality, and initiative. Further, leadership and social influence, technology use, monitoring and control, technology design and programming are skills that WEF lists on top. Finally, resilience, stress tolerance and flexibility, reasoning, problem-solving and ideation conclude the list. All these call for reskilling or upskilling of the work force as WEF puts it. In the Finnish context, the national forum for skills and anticipation organized by the Finnish National Agency for Education (<https://www.oph.fi/en>) has developed education and training needs cards containing information about the future competence needs covering all industrial sectors. Social, health and well-being services have their cards as well. These cards underscore technical competences related to digital transformation, but also ethicality, collaboration, interaction, and communication skills are considered as important future skills in both health and social care. It is noteworthy that KM competences are not explicitly listed.

Second, in addition to the general skills and competences of the knowledge society, there are competence needs posed by the institutional context, which in this case refers to the governance of health and social care. Here, we refer to the governance and management category, which was included in our survey. In this category, the needed competences range from mastering the legislative framework of health and social care to being able to recognize various knowledge needs related to strategic management, customer needs, operations management, supervision, and anticipation of the future expectations (cf. Jidkov et al, 2019). At various levels of the service system, these aspects of governance scale differently. Third, KM competence needs to relate specifically to the information management cycle (cf. Choo 2002). This process proceeds from the recognition of information needs and gathering and producing of information to organizing and storing of the information, and ends with the analysis, sharing and use of information. Several different competences are needed within this process as evidenced by our survey.

As we see, an answer to the question regarding KM competences in health and social care is not straightforward. Whereas in some other context it could be reasonable to focus more narrowly on some specific expertise, in this context, a more diverse analysis is called for. Especially when the system is looked from the viewpoint of national-level information steering, and when the research question is set up to map the status of KM competences at the system-level, a thorough understanding of the application context is called for.

Finally, based on the literature on KM capabilities (e.g., Gold et al, 2001; Alavi & Leidner, 2001) and empirical data gathered through surveys targeted to practitioners, the article concludes that: 1) It is difficult to separate the discussion on competence needs from the discussions concerning the information content and tools of data management. These dominate the current debate and determine and limit in many ways the discussion on KM in the management of social and health care – its nature, content, and people participating in the discussion. Our empirical data evidenced how difficult it is for practitioners to engage in a discussion on KM competences. It was easier to guide the discussion on the technical challenges or the missing information contents. 2) There seems to remain a knowledge gap, both in theory and in practice, regarding KM competences. Research on KM in management of health and social care has focused on issues of data management and decision-making

support. The focus has been extensively on organizational capabilities and the individual perspective has been forgotten despite it is widely agreed that human capital is often the most important resource for modern organizations.

References

- Alavi, M. & Leidner, D.E. (2001) "Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues", *MIS Quarterly*, Vol. 25, No. 1, pp 107-136.
- Argote, L. & Ingram, P. (2000) "Knowledge transfer: a basis for competitive advantage in firms", *Organizational Behavior and Human Decision Processes*, Vol. 82, No. 1, pp 150-169.
- Choo, C.W. (2002) *Information Management for the Intelligent Organization. The art of Scanning the Environment*. USA, Information Today.
- Dumay, J. (2020) "Using critical KM to address wicked problems", *Knowledge Management Research & Practice*, Vol. ahead-of-print No. ahead-of-print, pp. 1-9.
- Gold, H., Malhotra, A. & Segars, A.H. (2001) "Knowledge management: An organizational capabilities perspective", *Journal of Management Information Systems*, Vol. 18, No. 1, pp 185-214.
- Grant, R. M. (1996) "Toward a Knowledge-Based Theory of the Firm", *Strategic Management Journal*, Vol. 17, pp 109-122.
- Edvinsson, L. & Malone, M.S. (1997) *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*, Harper Business, New York, NY.
- Evans, J.M., Brown, A. & Baker, G.R. (2015) "Intellectual capital in the healthcare sector: a systematic review and critique of the literature", *BMC Health Serv Res*, 15, 556-570.
- Guthrie, J. & Dumay, J. (2015) "New frontiers in the use of intellectual capital in the public sector", *Journal of Intellectual Capital*, Vol. 16, No. 2, pp 258-266,
- Hansen, M.T., Nohria, N. & Tierney, T. (1999) "What's your strategy for managing knowledge?", *Harvard Business Review*, pp 106-116.
- Heisig, P. (2009) "Harmonisation of knowledge management – comparing 160 KM frameworks around the globe", *Journal of Knowledge Management*, Vol. 13, No. 4, pp 4–31.
- Heisig, P., Suraj, O.A., Kianto, A., Kemboi, C., Perez Arrau, G. & Fathi Easa, N. (2016) "Knowledge management and business performance: global experts' views on future research needs", *Journal of Knowledge Management*, Vol. 20, No. 6, pp 1169–1198.
- Hujala, T. & Laihonen, H. (2021) "Effects of Knowledge Management on the Management of Health and Social Care: a systematic literature review", *Journal of Knowledge Management*, Vol. 25, No. 11, pp 203-221.
- Inkinen, H. (2016) "Review of empirical research on knowledge management practices and firm performance", *Journal of Knowledge Management*, Vol. 20, No. 2, pp 230–257.
- Jidkov, L., Alexander, M., Bark, P., Williams, J.G., Kay, J., Taylor, P., Hemingway, H. & Banerjee, A. (2019) "Health informatics competencies in postgraduate medical education and training in the UK: a mixed methods study", *BMJ Open*, Vol. 9
- Kinnunen, U-M. & Saranto, K. (2018) "A Synthesis of Students' Theses in the Accredited HHSI Master's Programme", in Ugon, A., Karlsson, D., Klein, G.O., Moen, A. (eds.) *Building Continents of Knowledge in Oceans of Data: The Future of Co-Created eHealth*. IOS Press, Amsterdam, *Studies in Health Technology and Informatics 247*, 815-818.
- Laihonen, H. & Kokko, P. (2020) "Knowledge Management and Hybridity of Institutional Logics in Public Sector", *Knowledge Management Research & Practice*.
- Laihonen, H. & Huhtamäki, J. (2020) "Organizational Hybridity and Fluidity: Deriving New Strategies for Dynamic Knowledge Management", *Knowledge Management Research & Practice*.
- Laihonen, H. & Mäntylä, S. (2017) "Principles of performance dialogue in public administration", *International Journal of Public Sector Management*, Vo. 30, No. 5, pp 414-428.
- Lönnqvist, A. & Laihonen, H. (2017) "Management of knowledge-intensive organizations: what do we know after twenty years of research?" *International Journal of knowledge-based development*, Vol. 8, No. 2, pp 154-167.
- Laihonen, H. (2015) "A managerial view of the knowledge flows of a health-care system", *Knowledge Management Research & Practice*, Vol. 13, No. 4, pp 475-485.
- Laihonen, H. (2012) "Knowledge structures of a health ecosystem", *Journal of Health Organization and Management*, Vol. 26, No. 4, pp 542-558.
- Laihonen, H. (2006) "Knowledge flows in self-organising processes", *Journal of Knowledge Management*, Vol. 10, No. 4, pp 127-135.
- Nonaka, I. & Takeuchi, H. (1995) *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press, New York.
- Rajala, T. & Laihonen, H. (2019) "Managerial choices in orchestrating dialogic performance management", *Baltic Journal of Management*, Vol. 14, No. 1, pp 141-157.
- Riege, A. (2005) "Three-dozen knowledge-sharing barriers managers must consider", *Journal of Knowledge Management*, Vol. 9, No. 3, pp 18-35.
- Roos, J., Roos, G., Dragonetti, N. & Edvinsson, L. (1997) *Intellectual Capital: Navigating the New Business Landscape*, Macmillan Press Ltd, London.

- Saranto, K. & Kinnunen, U-M. (2021) "Applied Informatics Research in Nursing for eHealth", in Hussey P. & Kennedy M.A. (eds) *Introduction to Nursing Informatics*. Springer, Cham.
- Saranto, K., Kinnunen, U-M., Kivekäs, E., Huusko, J., Kuusisto-Niemi, S. (2017) "The Guiding Role of a Paradigm in Informatics Education and Research", *Studies in Health Technology and Informatics*, Vol. 238, pp 235-238.
- Sillanpää, V., Lönnqvist, A., Koskela, N., Koivula, U., Koivuaho, M. and Laihonen, H. (2010) "The role of intellectual capital in non-profit elderly care organizations", *Journal of Intellectual Capital*, Vol. 11, No. 2, pp 107-122.
- Spender, J.C. (1996) "Making Knowledge the Basis of a dynamic theory of the firm", *Strategic Management Journal*, Vol. 17, pp 45-62.
- Sveiby, K.-E. (1997) *The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets*, Berrett-Koehler Publishers Inc., San Francisco, CA.
- Thye, J., Esdar, M., Liebe, J-L., Jahn, F., Winter, A. & Hübner, U. (2020) "Professionalism of Information Management in Health Care: Development and Validation of the Construct and Its Measurement", *Methods of Information in Medicine*, Vol. 59, No. 1, pp e1-e12
- Thye, J., Shaw T., Hüsers J., Esdar M., Ball M., Babitsch B. & Hübner U. (2018) "What Are Inter-Professional eHealth Competencies?", *Studies in Health Technology and Informatics*, Vol. 253, pp 201-205.
- Watson, R. T. (1999) *Data Management: Databases and Organizations* (2nd ed.), John Wiley, New York.
- Wiig, K.M. (2002) "Knowledge management in public administration", *Journal of Knowledge Management*, Vol. 6, No. 3, pp 224-239.
- Zack, M. (1999) "Developing a knowledge strategy", *California Management Review*, Vol. 41, pp 125-45.