ADVANCING INNOVATION READINESS IN LONG-TERM CARE FOR OLDER ADULTS

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The cover and each chapter features photo cards selected by respondents in the qualitative study (Chapter 3). The semi-structured interviews were supported by the selection of photo cards to explore respondents’ descriptions of innovation readiness of long-term care organizations for older adults. Participants could select one or more cards. https://osf.io/j64kv/files/tzyvw
The cover is inspired by The Schallmaier Index, a photo feature in NRC Handelsblad (a Dutch national newspaper). It gathers photographs that look similar. Showing these images side by side helps to reflect on patterns and meaning without using numbers or scores.

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Speciale dank aan alle (zorg) professionals, organisaties, partners en collega’s die dit onderzoek mogelijk maakten door mee te doen, mee te denken en soms ook te twijfelen.

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For those who prepare today, for the care of tomorrow:

“Take a chance, play your part, but if you think that time will change your ways, don’t wait too long.”

Lyrics from the song: Don’t Wait Too Long
By Madeleine Peryoux, jazz singer and songwriter

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CHAPTER 1

General introduction

Background

Organizing innovation effectively has become crucial for long-term care organizations for older adults. It can directly affect the ability of these organizations to meet the increasing demand for long-term care services, address the declining number of healthcare professionals, and manage resource limitations, all while maintaining high-quality care and a positive work environment (1-3). The research presented in this dissertation explored the factors that enhance “innovation readiness” and sought to develop an approach for care organizations to assess such readiness. An exploratory approach was chosen to identify and understand the key factors that contribute to innovation readiness. Based on these insights, a self-assessment approach was then developed and tested to help organizations identify areas for improvement and better integrate organizing for innovation into their overall strategy.

Situating innovation in long-term care

This dissertation adopts the definition of innovation developed by Greenhalgh et al. (4, 5), who describe innovation as *“a set of behaviors, routines, and ways of working, which are perceived as new by a proportion of key stakeholders, linked to the provision or support of healthcare, discontinuous with previous practice, directed at improving health outcomes, administrative efficiency, cost effectiveness, or user experience, and that are implemented by planned and coordinated actions by individuals, teams or organizations.” (p.40).* Here, innovation refers to the intentional and systematic introduction of new ways to organize, deliver, or support care that result in improved outcomes for clients, professionals, and organizations (6, 7). Innovation in long-term care is also often considered contextual, which means that what qualifies as “innovative” frequently depends on local culture, leadership, staffing, and resources (8).

Innovation can take different forms, such as incremental innovation, which involves small, step-by-step improvements to existing processes or tools, such as assessing quality of care through narrative methods (10, 11) and redesigning workflows with AI-assisted triage to free up staff time (12, 13). In Dutch policy contexts, the term “renewal” is often used as a practical way to describe this type of innovation, with specific reference to tangible changes that become visible in everyday practice (14-16). Radical innovation involves fundamental and systemic changes within existing structures. An example of this would be the Green Care Farms, which are small, homelike communities that replace institutional nursing homes (17). Disruptive innovation, on the other hand, refers to breakthroughs that fundamentally challenge or replace established care delivery models, like tele-health and robotics transforming traditional care roles (9, 18).

Innovation in long-term care is generally seen as practice-based improvement that enhances care quality, work routines, job satisfaction, or residents’ well-being. It is often developed collaboratively with care professionals, residents, and families (19-23). The range of innovations in long-term care is broad and can include, for example, social, process, and technological innovations (24). Technological innovations involve

applications of digital tools and technologies that transform care processes, such as digital monitoring technology in care facilities (e.g., digital night surveillance) (13, 25-27). Much of the innovation in long-term care is non-technological in nature (28-31) and includes, among other things, social innovations that create social value and focus on the participation of residents and their families, such as the role of informal caregivers in long-term care settings (32). Process innovations, like new care pathways, can lead to more coordinated and effective care, as seen in the implementation of integrated care pathways for dementia care (33).

Innovation in long-term care is essential to deal with future challenges

Long-term care includes a range of services designed to meet a person's health and personal care needs when they can no longer perform daily activities independently (34, 35). As global life expectancy increases and fertility rates decline, societies are undergoing an unprecedented demographic shift. By 2050, the global population aged 60 and above will double to 2.1 billion. The number of individuals aged 80 and older is projected to triple from 2020 to 2050, reaching 426 million (36). This trend presents significant challenges, including a rising demand for long-term care services among older adults, alongside a shrinking workforce of skilled healthcare professionals to meet these increasing needs (1, 37). These demographic and workforce shifts have far-reaching implications. Not only does the growing demand for long-term care put pressure on service delivery and workforce capacity, it may also contribute to an increasing moral burden on frontline care professionals, as they are required to make difficult trade-offs in the context of resource constraints (38). Furthermore, it also causes a structural increase in long-term care spending relative to national economic output in high-income countries (39). Consequently, governments face complex policy decisions about resource allocation to support their aging populations (40, 41). Long-term care, therefore, stands at a pivotal point where demographic pressures and resource limitations require innovative solutions (42).

Dutch long-term care organizations, which provide complex institutional care (e.g., in nursing homes and residential care facilities, as well as home-based care), are mainly funded through mandatory public health insurance (43, 44). Driven partly by policies from government agencies, care offices, and insurance providers, long-term care organizations for older adults anticipate ongoing societal and economic changes by integrating innovation into their strategies (45, 46). Innovation has shifted from a "nice to have" to an essential requirement for organizational survival and the delivery of high-quality care (47-49). For example, many long-term care organizations have adopted reablement programs that encourage older adults to actively participate in daily activities to support both residents and staff (32, 50, 51). These innovations are no longer optional experiments but vital tools for maintaining safe and efficient care (52, 53).

Innovation in long-term care seems challenging

Although they face similar demographic pressures, there are indications that long-term care organizations for older adults vary in their ability to innovate (54-58). Some organizations appear more capable than others of effectively organizing their innovation efforts (54, 59-62). Research shows that, despite increased investment in healthcare innovation, many initiatives still fail to reach their intended outcomes (63, 64). Several studies indicate that innovative practices are often only partly implemented or eventually discarded (63, 65). Reported failure rates of over 50% (63, 64) highlight the importance of effective innovation management and thorough preparation for care implementations.

Barriers to successful innovation are often described as a lack of strategy, “resistance” to innovation, unstructured innovation processes, and limited learning and evaluation (20, 65-68). Without a clear strategic focus, organizations may introduce several innovations simultaneously, which can lead to confusion and resistance. In such cases, small-scale pilots are frequently launched without being spread, as there is no overarching vision to guide decision-making (67, 69). Resistance from health professionals does not necessarily indicate opposition to innovation itself but often results from how it is introduced and the values it seems to replace (70-72). Nilsen et al. (73) and Renkema et al. (74) found that professionals in long-term care frequently report a lack of time, space, and opportunities to participate meaningfully in innovation processes. Organizations also face challenges in structuring their innovation processes due to a lack of systematic planning and decision-making for innovation (66, 75). Nauta and Crombach (67) found that this often leads to innovation initiatives being added “on top of” existing practices without fully adapting care processes to benefit from them. De Carvalho Corôa et al. (76) suggest that investing in a thorough evaluation of the effectiveness of promising innovations could offer significant opportunities to improve the adoption of innovation practices in long-term care. However, Davy et al. (66) show that there is currently insufficient attention and support for activities that strengthen organizations’ capacity for (self-)learning and evaluation, creating a cycle in which organizations struggle to learn from their innovation experiences and to improve future efforts.

The need for a tailored approach: innovation readiness

Research on healthcare innovation has intensified since the early 2010s, as healthcare systems worldwide have begun to recognize innovation as essential for addressing demographic, financial, and workforce challenges (77, 78). Organizations can significantly benefit from understanding how to prepare for success in any innovation to address their strategic challenges (54, 79), but clear evidence on how to effectively support innovation in healthcare remains limited, especially in the long-term care setting. However, several studies provide valuable insights (4, 65, 80).

In the business literature, Yen et al. (81) discuss “service innovation readiness” focusing on a firm’s preparedness for innovation; they show that being prepared for

service innovation helps organizations perform better when introducing new services. In healthcare, Williams (80) pointed out that organizational factors need attention to enhance an organization's ability to innovate, which he calls "organizational readiness for innovation." He notes that becoming "innovation ready" or "moving to a state of readiness for innovation" requires more research attention. Greenhalgh et al. (4, 65) see "the readiness of the inner context" as the steps organizations must take to improve their ability to innovate and evaluate the impact of innovations. The features of this inner context have been shown to influence the likelihood of successful innovation adoption. Both studies indicate that there is little empirical evidence about which factors help organizations effectively organize innovation in healthcare and that more focus is needed in both research and practice.

Understanding and assessing innovation readiness

"Innovation readiness" research in healthcare is still a relatively new field (82) and appears to lack a definition and framework to guide improvements in research and practice (80, 83, 84). Instruments have been developed to evaluate organizational readiness to implement knowledge- or evidence-based practices in healthcare organizations (85-87). However, validated tools for assessing innovation readiness specifically in healthcare organizations still seem to be unavailable (88). This requires a deeper understanding of the innovation readiness concept and the specific factors that influence it in long-term care settings, along with practical tools to help organizations assess and improve their readiness (6, 54, 89, 90). Turning this understanding into actionable insights can help care professionals, policymakers, and educators improve effective organization for innovation.

In the absence of a consistent and detailed interpretation, we have chosen in our discussions with management and healthcare professionals in long-term care (4, 65, 80) to use the term "innovation readiness." Innovation readiness applies to all types of innovation and the entire innovation cycle, which typically includes the following phases: idea discovery and generation, idea selection, solution development, implementation, scale-up, and diffusion (7, 67). Opportunities for innovation are identified, selected, and refined during the early stages. During the implementation phase, healthcare professionals test the innovation in real-world settings (91). In the final stage, actions are taken to support the full-scale spread of the intended innovation.

The term innovation readiness has proven helpful in exploring and understanding factors to enhance "innovating." In management and organizational studies, the term "innovating" emphasizes that innovation is an ongoing organizational process rather than a one-time event. Tidd and Bessant (7) describe innovating as the continuous process of "doing innovation." Likewise, Van de Ven (92) uses the term to characterize innovation as a dynamic, iterative, and collective journey in which organizations constantly learn, adapt, and reorganize their activities based on emerging insights and challenges. In this dissertation, we support these perspectives and see "innovating" as an active, evolving process integrated into everyday organizational practice. In our view, to become better at

innovating, organizations must actively organize for innovation (93). Success in innovating depends on a combination of factors and requires a tailored systematic approach.

AIM AND OUTLINE OF THIS DISSERTATION

To support organizations in enhancing their innovation readiness, it is essential to better understand the key factors that contribute to successful innovating. This understanding can provide the basis for developing a framework and an approach to help organizations assess and enhance their innovation readiness.

Aim

The overall aim of this dissertation is to advance understanding of innovation readiness in long-term care and to develop an approach for organizations to assess it.
Specifically, the research questions guiding this dissertation are:

1. Which key factors contribute to innovation readiness in long-term care organizations for older adults?
2. How can long-term care organizations be supported in assessing innovation readiness?
3. What insights and patterns of innovation readiness can be observed across Dutch long-term care organizations?

OUTLINE

In Chapter 2, we present the results of a scoping review of studies examining innovation readiness in healthcare organizations. This chapter summarizes factors that may contribute to innovation readiness and introduces a first outline of a framework capturing these factors. In Chapter 3, we describe the results of an interview study conducted with Dutch stakeholders to gain insights into the factors contributing to the innovation readiness of long-term care organizations for older adults, leading to the initial innovation readiness framework. In Chapter 4, we show the results of a Q-methodology study that, first, examined whether stakeholders agree with the factors leading to the final Maastricht Innovation Readiness Framework, and second, explored stakeholder perspectives on innovation readiness in Dutch long-term care for older adults. In Chapter 5, we present a cross-sectional study examining the feasibility of the Maastricht Innovation Readiness Approach (MIRA) across Dutch long-term care organizations. In Chapter 6, we present the results of a descriptive cross-sectional study examining how Dutch long-term care organizations assess their innovation readiness using the MIRA Questionnaire. In Chapter 7, we summarize the main findings of this dissertation, reflect on the methodological and theoretical considerations, and discuss the implications of these findings for policy, practice, research, and education. Finally, in Chapter 9, the impact of the findings is described.

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CHAPTER

2

Factors contributing to innovation readiness in healthcare organizations: a scoping review

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Abstract

Background

Increasing innovation readiness of healthcare organizations is necessary to meet upcoming challenges, including population aging, staff shortages and reduced funding. Healthcare organizations differ in the extent to which they are innovation ready. This review aims to clarify the concept of innovation readiness and identify which factors contribute to innovation readiness in healthcare organizations.

Methods

A scoping review was conducted based on the framework from Arksey and O'Malley. PubMed/MEDLINE, CINAHL and Web of Science were searched for studies that (a) aimed to contribute to scientific knowledge about innovation readiness of healthcare organizations, (b) were peer-reviewed, (c) reported empirical data and (d) were written in English, Dutch or German. Factors researched in the included studies were bundled into 4 overarching main factors and 10 sub-factors.

Results

Of the 6,208 studies identified, 44 were included. The majority (n=36) of the studies had been conducted since 2011, and almost half of the studies (n=19) were performed in hospitals. Of the 44 studies, 21 researched factors contributing to innovation readiness in the implementation stage of the innovation process. The authors used a variety of words and descriptions addressing innovation readiness, with hardly any theoretical frameworks for innovation readiness presented. Four main factors and 10 sub-factors contributing to the innovation readiness of healthcare organizations were summarized: strategic course for innovation, climate for innovation, leadership for innovation and commitment to innovation. Climate for innovation (n=16) was studied the most and individual commitment to innovation (n=6) was the least studied.

Conclusion

Our study identified four main factors contributing to the innovation readiness of healthcare organizations. Research into innovation readiness of healthcare organizations is a rather new field. Future research could be directed towards defining the concept of innovation readiness and the development of a framework for innovation readiness. More understanding of the interplay of factors contributing to innovation readiness in all stages of the innovation process and in diverse healthcare settings can support healthcare managers to structurally embed innovation. This review contributes to the first stage of theory building on factors contributing to innovation readiness of healthcare organizations.

Background

Upcoming challenges such as population aging, staff shortages and reduced funding compel healthcare organizations to innovate (1-5). Greenhalgh et al. (6) see innovation as "a novel set of behaviors, routines and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost effectiveness, or user experience and that are implemented by planned and coordinated actions." Success in innovating depends on an interplay of factors (2, 7) and needs to be planned (8, 9). Healthcare organizations show large differences in the extent to which they are capable of innovating (10-13). Increasing the readiness of healthcare organizations for innovation is required to meet the challenges they face (1-5, 13).

Although of great importance, embedding innovation structurally in healthcare organizations is not simple (14-16). Organizations encounter difficulties in structuring their innovation processes (3, 17, 18), while existing procedures and regulations often restrain innovative initiatives (10, 19); moving to a state of readiness for innovation differs from preparing to introduce a specific innovation (2). While many studies focus on the implementation of specific treatment or e-health innovations (20-24), scientific knowledge about what is needed for healthcare organizations to become innovation ready is limited (2, 25, 26). Scientists have only recently focused attention on organizational readiness for innovation in healthcare settings (4).

Healthcare organizations can greatly benefit from knowledge about how to prepare to succeed in any type of innovation to meet strategic challenges (10, 27-29). To the best of our knowledge, there are no overviews that specifically address factors contributing to innovation readiness in healthcare organizations. Therefore, we conducted a scoping review (1) to clarify the concept of innovation readiness and (2) to identify available research on the factors contributing to innovation readiness in healthcare organizations. Innovation readiness in business and healthcare received various explanations, with no generally accepted explanation in the literature (2, 4, 30). Innovation readiness is explicitly referred to as the ability to innovate by Zerfass et al. (31).

In our view innovation readiness indicates the level of maturity of an organization to succeed in any type of innovation. Moving to a state of readiness for innovation has a broader scope than the introduction of a specific innovation (32). Innovation readiness comprehends the entire innovation cycle while organizational readiness for change specifically measures the successful adoption of new innovations (15).

Methods

The scoping review was conducted based on the framework from Arksey and O'Malley (33) and the Joanna Briggs Institute's recommendations for conducting scoping reviews (34). The reporting is according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist; see Appendix 1 for PRISMA Checklist (35).

Identifying the research question

The scoping review question guided the development of the inclusion criteria and provided a clear structure for the development of the scoping review. As with the title, the question incorporates the population, concept, and context elements (36): What is known in scientific literature about: (1) the concept of innovation readiness (definitions, theories, frameworks) (2) the factors that are studied contributing to innovation readiness in healthcare organizations. The review aims to map a range of factors that contribute to innovation readiness (concept) for healthcare organizations (population and context). In this review the population and the context (healthcare organizations) overlap. For this study in the healthcare context, we consider 'innovation readiness' to be the level of maturity of an organization to succeed in any type of innovation and 'becoming or being innovation ready' as an ongoing, coherent and tuned process consisting of planned and coordinated actions to optimize the entire innovation cycle.

Identifying relevant studies

The literature search was executed on June 11, 2021, within three databases: PubMed/MEDLINE, (biomedical literature from MEDLINE, life science journals, and online books), CINAHL (focus on nursing journals) and Web of Science (scholarly journals in science, social sciences, and humanities disciplines) (see Appendix 2: Detailed search terms used in the PubMed search). Web of Science was added as a database to identify studies about innovation readiness published in economic and innovation journals.

In March 2021 the term "innovation readiness" was explored via a preliminary search in Google scholar and PubMed/MEDLINE to identify relevant and related concepts and terms. Innovation readiness (the term itself and the broader meaning) appeared in a diversity of related terms e.g., innovation/organization capacity/potential, ready for and in a diversity of scientific journals (e.g. medicine, health, innovation, management, economy).

The search strategy is based on the main concept term: innovation readiness for PubMed/Medline and CINAHL and on the main concept terms: innovation readiness and healthcare for Web of Science. Innovation readiness is a nonspecific search term in all three databases. We studied recent systematic and scoping reviews for the search strategies employed for operationalizing the innovation readiness concept. To formulate the search strings, relevant keywords and synonyms were identified for each concept term in addition to the controlled vocabulary terms (such as the MeSH headings in PubMed). Reference lists of articles that fulfilled the inclusion criteria were searched to identify additional papers. The final search strategy is available as appendix to the review. As the database Web of Science includes articles of a diverse setting (broader than the healthcare setting of Pubmed and Cinahl) we operationalized the healthcare concept via studying recent healthcare research, which we adapted for our use.

The search for this scoping review was quite iterative as in time we became more familiar with the additional keywords and sources, and potentially useful search terms discovered and incorporated into the search strategy. The search strategy was

discussed on several occasions by the research team (also authors) as well as reviewed twice by a research librarian from Maastricht University.

Eligibility criteria and study selection

Studies were included if the study (a) aimed to contribute to scientific knowledge about innovation readiness of healthcare organizations, (b) was peer-reviewed, (c) reported empirical data and (d) was written in English, Dutch or German. We included German and Dutch, besides English (authors are fluent in these languages) to broaden the scope and the number of available articles. The results from the database search were merged and duplicates were removed using reference-management software (Endnote).

Author MH screened all articles by titles and by abstracts for eligibility and author RB screened a random selection of 10%. Both authors compared their assessment decisions, logged in review software Rayyan and resolved discrepancies through consensus. These phases produced 161 'included studies'. In the next phase (screening via full text), two authors (MH, EV) independently screened and discussed 100% of the full text of the retrieved studies and scored them as 'include', 'possibly include' or 'exclude'. Reference lists of included studies were searched by the author MH to identify additional studies. All extracted data were discussed within the research team. The selection process followed the PRISMA 2020 flow chart (see Figure 1).

Data extraction

A data extraction table was developed. Two authors (MH, EV) extracted the data of half of the studies and verified each other's data. The data charting table consists of author(s), year, country(ies), study aim, design, setting and factor(s). A factor is the key construct of innovation readiness addressed in the study.

Summarizing and reporting the results

For the first part of the research question, definitions and descriptions of innovation readiness as well as frameworks were extracted from the included studies. A framework (including theoretical models or frameworks related to innovation readiness) demonstrates the understanding of the factors, variables, or constructs and the presumed relationships between them, addressed in the study, often being displayed graphically (37). For the second part of the research question, two authors (MH, EV) listed the main factors contributing to innovation readiness, as well as the main results of the studies to identify key characteristics of the factors contributing to innovation readiness. Based on the descriptions of factors studied factors were then bundled into 4 overarching main factors and 10 sub-factors. Although some sub-factors may relate to more than one main factor, it was decided to assign each sub-factor to one main factor.

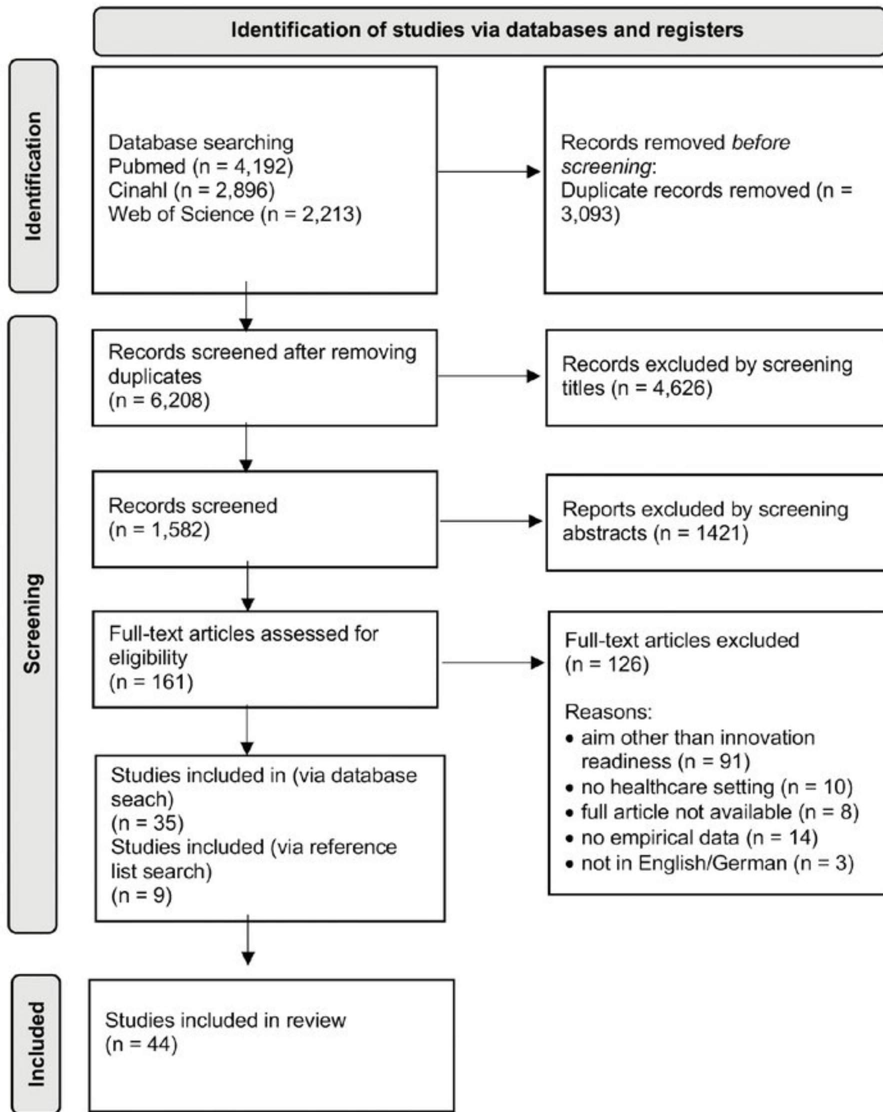

Figure 1 PRISMA 2020 flow diagram of search of databases, identification and inclusion for the review

Table 1 Characteristics of the 44 included studies

Author(s) (year of publication)	Country(ies)	Aim of data collection	Design	Setting	Factor(s) studied (described by authors(s))	Sub-factors
Anvik et al. (2020) (38)	Norway	to investigate the conditions under which learning and innovation occur within nursing homes	qualitative	nursing home	workplace learning and innovation	room for learning
Atkinson and Singer (2020) (39)	USA	to examine how interdisciplinary teams developing healthcare innovations manage challenges that may arise from within their organizational context over the lifecycle of the innovation process	qualitative	hospital	constraints in the innovation process	innovation process
Barnett et al. (2011) (40)	UK	to understand how innovators from healthcare organizations made sense of factors that either facilitated or obstructed the innovation implementation and diffusion	qualitative	health care organizations	factors influencing the innovation implementation and diffusion	innovation process
Benson (2019) (41)	UK	develop a set of short generic user-reported related measures to help understand how and why healthcare innovations spread.	qualitative	hospital	article included for definition	
Birken et al. (2015) (42)	USA	to assess the influence of top managers' support on middle managers' commitment to innovation implementation	mixed-method	health centers	middle managers' commitment to innovation	middle manager's role
Bunn et al. (2020) (43)	UK	to study researcher's awareness of organizational context in the collaboration of health care organizations and university researchers on in-house innovation	qualitative	nursing home	organizational context	inter-organizational links
Carpenter et al. (2018) (44)	USA	to study how learning communities can support innovation adoption	qualitative	hospital	learning communities	room for learning
Chuang et al. (2011) (45)	USA	to understand the organizational and relational factors that influence middle managers' support for the innovation implementation process.	qualitative	health care organizations	middle manager support for the innovation process	middle manager's role
Cramm et al. (2013) (46)	The Netherlands	to explore the importance of a professional's perceived effectiveness, organizational support, and management support for innovative culture	mixed-method	long-term care	innovative culture	innovative culture

Table 1 (continued)

Author(s) (year of publication)	Country(ies)	Aim of data collection	Design	Setting	Factor(s) studied (described by authors(s))	Sub-factors
Dohan et al. (2017) (47)	Canada	to investigate the link between technology-related knowledge and skills of healthcare professionals and the ability of healthcare organizations to innovate	mixed-method	paramedics	technology-related skillsets of healthcare professionals	innovative competencies
Emiralioglu and Sonmez (2021) (48)	Turkey	to determine the relation between employees' work environment and innovation support and innovative behaviors of employees	mixed-method	hospital	employees' innovative behavior	innovative behavior
Engle et al. (2017) (49)	USA	to expand the understanding of middle managers' influence in organizations by looking at their activities	qualitative	veteran medical center	middle managers influence	middle manager's role
Fleuren et al. (2004) (50)	The Netherlands	to explore which determinants of innovation strategies are reported in the literature	mixed method	implementation experts	(determinants of the) innovation strategy	innovation strategy
García-Goñi et al. (2007) (51)	Spain	to study the differences in behavior of managers and front-line employees towards innovation and the involvement in the innovation processes	quantitative	public health	role of the middle manager	middle manager's role
Glover et al. (2020) (52)	Israël	to examine the relationship between unit complexity, autonomy, performance orientation and innovation	mixed-method	hospital	relation between unit complexity and innovation programs	innovation process
Goes and Park (1997) (53)	USA	to conceptualize various types of interorganizational links as opportunities for learning and resource sharing in the pursuit of innovation	mixed-method	hospital	Interorganizational links	inter-organizational links
Gunzel-Jensen et al. (2018) (54)	Denmark	to study the interaction between different types of leadership (transformational, transactional and empowering leadership) and the innovative behavior employees	mixed-method	hospital	leadership (transformational, transactional and empowering)	leadership style

Table 1 (continued)

Author(s) (year of publication)	Country(ies)	Aim of data collection	Design	Setting	Factor(s) studied (described by authors(s))	Sub-factors
Helfrich et al. (2007) (55)	USA	to study and adapt an organizational framework of innovation implementation (out of manufacturing) for implementation in the health sector	qualitative	clinical research network	organizational framework of innovation implementation effectiveness	innovative culture
Hunter et al. (2021) (56)	USA	to report on a competition-based program designed to accelerate early-stage, innovative health care ideas from within the healthcare organization	qualitative	hospital	innovation program	innovation program
Hyrkas et al. (2020) (57)	Finland	to develop and test a co-creation model for collaborative innovation, in which companies and healthcare professionals co-create future health care services	qualitative	hospital	collaborative / co-creation innovation process	innovation process
Jacobs et al. (2015) (20)	USA	to examine the innovation implementation framework: the organizational factors that determine effective innovation implementation	quantitative	hospital	innovation implementation (climate)	innovative culture
Jaskyte and Dressler (2005) (58)	USA	to improve innovation models by incorporating organizational culture into the conceptual model along with transformational leadership and size variables.	mixed-method	association of retarded citizens	organizational culture	innovative culture
Jonsson et al. (2020) (59)	Denmark	to develop and validate a measurement for the relation between distributed leadership agency and innovation by employees	quantitative	hospital	employee-driven innovation	innovative behavior
Joseph (2015) (60)	USA	to explore the experiences of nurse leaders and nurses in a hospital whose patient care mission was stated as innovation	qualitative	hospital	organizational culture and climate	innovative culture
Keown et al. (2014) (61)	UK	to test a framework highlighting the cultural dynamics to support innovation and its diffusion	mixed-method	health care professionals	factors and behaviors that foster innovation	innovative culture

Table 1 (continued)

Author(s) (year of publication)	Country(ies)	Aim of data collection	Design	Setting	Factor(s) studied (described by authors(s))	Sub-factors
Leal-Rodriguez et al. (2013) (62)	Spain	to test the relationship between knowledge management and the effectiveness of the innovation process	quantitative	hospital	the innovation process	innovation process
Lombardi et al. (2018) (63)	USA	to test a framework to characterize the essential organizational capabilities required for high-impact health care innovation	mixed-method	academic health center	organizational capabilities for high-impact health care innovation	innovation strategy
Masood and Afsar (2017) (64)	Pakistan	examining the influence of the role of leadership to develop and foster innovation	quantitative	hospital	transformational leadership	leadership style
Nieboer and Strating (2012) (65)	The Netherlands	to identify organizational characteristics that explain innovative culture in the (long-term) care sector.	quantitative	l(38)ong-term care	innovative culture	innovative culture
Reed et al. (2012) (66)	USA	to understand the process of patient-centered care innovation undertaken by innovative health care organizations	qualitative	health care professionals	innovation process	innovation process
Renkema et al. (2021) (67)	The Netherlands	to investigate the relationship between high-involvement human resource management, autonomy, affective organizational commitment and innovative behaviors	quantitative	nursing home	innovative behavior	innovative behavior
Rokstad et al. (2015) (68)	Norway	to investigate the role of leadership in the implementation of innovations	qualitative	nursing home	leadership	leadership style
Saidi et al. (2017) (69)	South Africa	to study the role of space in facilitating innovation	qualitative	hospital	workplace design	room for learning
Schultz et al. (2012) (70)	Germany	provide empirical evidence for controlling the size and innovativeness of a hospital's new health service and process portfolio	mixed-method	hospital	innovation (portfolio) management	innovation strategy

Table 1 (continued)

Author(s) (year of publication)	Country(ies)	Aim of data collection	Design	Setting	Factor(s) studied (described by authors(s))	Sub-factors
Schultz et al. (2017) (71)	Norway	to determine innovative readiness by looking at group climate	quantitative	hospital	group climate	innovative culture
Somech and Drach-Zahavy (2013) (72)	Israel	to study the relation between team composition of creative personalities, team creativity and climate for innovation	mixed-method	primary care	climate for innovation	innovative culture
Taylor et al. (2020) (73)	UK	explore the process through which staff innovates, when resources are scarce	qualitative	health care organizations	employee-driven innovation	innovative behavior
Thomas et al. (2005) (74)	UK	to identify what organizational features support innovation	qualitative	primary care	capacity to learn and innovate	room for learning
Timmermans et al. (2013) (75)	Belgium	to explore the influence of team learning on the implementation of innovations	quantitative	mental health institutions	team learning	room for learning
Urquhart et al. (2018) (76)	Canada	to examine the role of middle managers relevant to innovation implementation and how middle managers experience the implementation process	qualitative	hospital	middle manager rol in innovation	middle manager's role
von Treuer et al. (2018) (77)	Australia	to examine the impact of organizational climate and leadership on organizational readiness for change	quantitative	nursing home	organizational climate leadership	innovative culture
Weatherford et al. (2018) (78)	USA	to identifying the characteristics of leaders of innovation	mixed-method	health care professionals	leaders of innovation competencies	innovative competencies
Zippel-Schultz and Schultz (2011) (79)	Germany	to analyze the role of business and project planning for innovation project success	quantitative	hospital	innovation program	innovation program
Zuber and Moody (2018) (80)	USA	to explore how health centered design tools support innovation in health care	mixed method	health care professionals	innovation (supportive) environment	room for learning

Results

Characteristics of the studies

The initial search strategy identified 6,208 references after duplicates were removed. After screening using the inclusion criteria, we retained 44 studies: i.e., (20, 38-58, 60-81). All articles are written in English. The details of the studies included in the review are presented in Table 1. Studies were published from 1997 onwards, with the majority (almost 90%) being published since 2011. Ten of the included studies were published in either 2020 or 2021. Most studies were conducted in Europe (n=22, 50%) and the USA (n=15, 34%) and in hospitals (n=19, 43%) and long-term care organizations (nursing homes, care providers for the mentally or physically disabled) (n=9, 20%). The research methods show a wide variety, such as group and individual (semi-structured) interviews, the Delphi study, observations of participant and project meetings, focus groups, (grey) literature reviews, prototyping, workshops, focus-groups, case studies, (online) questionnaires and statistical analysis. Qualitative research design was used in 18 studies, quantitative research design in 16 studies and a mixed method design in 10 studies.

Definition of innovation readiness and frameworks

Six studies present a definition or description. Of these, only Benson (41) uses the term innovation readiness: “the degree to which an individual or organization is relatively earlier in adopting new ideas than other members of the system”. Where Benson emphasizes both the individual and organizational level, all five other studies present descriptions referring to the organizational level. Benson and Jaskyte et al. both emphasize the numerical aspect of innovation readiness: the timing of the adoption (41) and the number of adopted innovations (58). Both Schultz et al. (71) and Von Treuer et al. (77) introduce the term readiness for change to describe “the likelihood of success in implementing an innovative change” (71). Furthermore, Schultz et al. (70) as well as Joseph (60) mention the process aspect of innovation: the process of using knowledge (70) and innovation as a social process (60).

The authors of the other 38 studies use a variety of words addressing innovation readiness. The most frequently mentioned are: capacity for innovation (38, 39, 56, 78), innovation capacity (57), capacity to innovate (58, 62, 63), ability to innovate (40, 47, 79), organizational innovativeness (58), organization's innovation ability (48), innovation performance (52, 67), innovativeness of organizations (65), organizational innovation (80) and organization’s innovative potential (81).

Twenty-two of the 44 studies present their findings in a graphical framework consisting of the factors studied. Twenty-one studies present a partial framework displaying the specific studied factors that contribute to innovation readiness. For example, the framework of Birken et al. (42) demonstrates the relationship between top managers’ support and middle managers’ commitment to innovation implementation in healthcare organizations. Urquhart et al. (76) graphically display the understanding of

middle managers' roles in innovation implementation and the determinants of fulfilling these roles. Only Lombardi et al. (63) present a total organizational framework displaying a full set of factors that work together to promote innovation readiness of an entire organization. Their framework consists of 21 facilitating factors that intertwine to facilitate innovation in a healthcare organization with culture, structure and policy being the key organizational determinants.

Factors contributing to innovation readiness

The authors MH and EV listed the factors of the 44 studies as described by the authors of the articles (see table 1: Factor(s) studied (described by authors(s)). The list consisting of 44 factors contributing to innovation readiness were bundled at the level of the organization, the team and the individual. After discussion and reflection in the research team the decision was made to adjust and rename this bundling. The factors at the organizational level were preconditional and were named as main factor: strategic course for innovation. Main factor: leadership for innovation and climate for innovation clearly stood out as relevant elements on the team level. The individual level was named the main factor: commitment to innovation to reflect the content of the combined factors. The main category defines a main factor contributing to innovation readiness. The sub category gives detail to the main category. The process in the research team was an iterative reflective process and was either based on a suggestion by one author or on a group discussion with all authors.

As a result the factors studied are categorized into four main factors: 1) strategic course for innovation, 2) climate for innovation, 3) leadership for innovation and 4) commitment to innovation. A general framework that represents the factors contributing to innovation readiness studied by the authors is presented in Figure. 2. The arrows in the framework depict the contribution of the four main factors to innovation readiness. The vertical presentation of the main factor climate for innovation illustrates its connectedness with the other three main factors. Each main factor consists of two or four sub-factors (see Table 2).

Table 2 (Main) factors contributing to innovation readiness researched in the included studies

Main factor		Sub-factor	Definition of factor
Strategic course for innovation			Strategic course for innovation refers to the top management preparing the organization's long-term direction to become innovation ready. It articulates the role and the importance of innovation for the organization in terms of strategic course and defines the allocation of resources between current operations and innovation.
	(50, 63, 70)	Innovation strategy	Innovation strategy concerns the alignment of innovation goals with the overall corporate strategy and prioritizes the desirable actions of employees
	(52, 56, 79)(39, 40, 57, 62, 66)	Innovation program	Innovation program refers to the coordinated plans and actions that an organization undertakes to implement the innovation strategy
	(39, 40, 57, 62, 66)	Innovation process	Innovation process concerns the policies and the steps that are taken in (part of) the organization from the idea of the innovation to sustaining the innovation. Innovation process has been researched in five studies
	(43, 53)	Inter-organizational links	Inter-organizational links concern the relations of an organization with other organizations and how the organization uses these links to enhance innovation readiness
Climate for innovation			Climate for innovation concerns creating a supportive organizational environment that contributes to innovation readiness and focuses both at the team and organizational level.
	(20, 46, 55, 58, 60, 61, 65, 71, 72, 77)	Innovative organizational culture	Innovative organizational culture concerns the way employees collectively think, behave and believe in relation to innovation readiness
	(38, 44, 74) (69, 75, 80)	Room for learning	Room for learning concerns an environment that encourages the organization and employees to learn, reflect and acquire the knowledge and skills contributing to innovation readiness
Leadership for innovation			Leadership for innovation concerns the role of leadership of top and middle management to contribute to innovation readiness.
	(54, 64, 68)	Leadership style	Leadership style concerns the attitude and behavior of managers in leading the way to become innovation ready.
	(42, 45, 49, 51, 76)	Middle manager's role	The middle manager's role concerns the responsibilities and motivation of middle managers for innovation readiness.

Table 2 (continued)

Main factor	Sub-factor	Definition of factor
Commitment to innovation		Commitment to innovation concerns organizational actions aimed at the attitude, training and development of individual employees to support them in their individual readiness to get better at innovating.
(48, 67, 73, 81)	Innovative behavior	Innovative behavior concerns employees undertaking innovative actions contributing to innovation readiness
(47, 78)	Innovative competencies	Innovative competencies concern the skills and motivation of employees to contribute to the innovation readiness of the organization

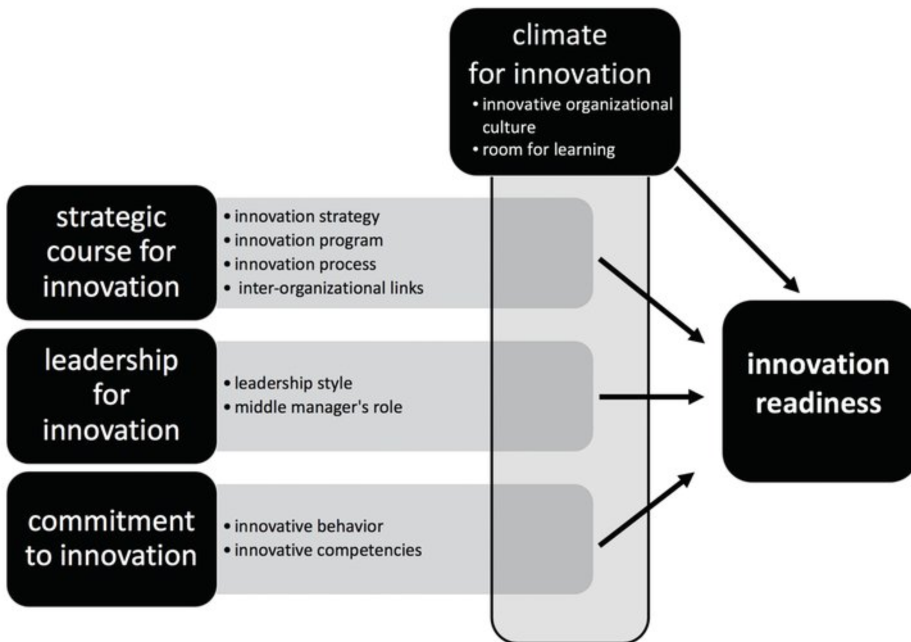

Figure 2 Factors contributing to innovation readiness

Strategic course for innovation

Strategic course for innovation refers to the top management preparing the organization's long-term direction to become innovation ready. It articulates the role and the importance of innovation for the organization in terms of strategic course and defines the allocation of resources between current operations and innovation. The main factor consists of the sub-factors innovation strategy, innovation program, innovation process and inter-organizational links and is focused on the organizational level.

Innovation strategy

Innovation strategy concerns the alignment of innovation goals with the overall corporate strategy and prioritizes the desirable actions of employees and was included in three studies (50, 63, 70). Two studies reported elements to design an effective innovation strategy: the characteristics of the socio-political context (e.g., legislation), the organization (e.g., the decision-making process), the adopting person (e.g., health professionals), the innovation (e.g., complexity) (50), organizational culture (e.g., values), organizational structure (e.g., processes, resources) and organizational policy (e.g., alignment of incentives) (63). Additionally, Schultz et al. (70) studied what instruments an organization can use to harmonize employee goals with those of the organization and encourage employees to participate in the innovation strategy.

The results demonstrated that formal instruments (e.g., rewards) and informal instruments (e.g., employee encouragement) influence the size and innovativeness of the innovation activities.

Innovation program

Innovation program refers to the coordinated plans and actions that an organization undertakes to implement the innovation strategy and is included in three studies (52, 56, 79). All studies examined factors that are relevant for designing a successful innovation program. Glover et al. (52) examined the influence of hospital unit complexity on innovation. Hospital units are described as complex as they cannot be fully understood through linear thinking alone and interactions between team members can produce unpredictable behavior and generate new behavior. In order to achieve high levels of innovation in these innovation programs, units with higher levels of complexity should respond with lower staff autonomy (e.g., independence) and greater emphasis on performance orientation (e.g., demonstrating competence). Hunter et al. (56) studied a competition-based program designed to accelerate early-stage, innovative healthcare ideas from within the healthcare organization. Employees were encouraged to submit innovative ideas and if selected, they were provided with business, legal, technical and scientific project management support to help accelerate their projects. The program was modeled around four factors: small and dynamic project manager-led teams, low barriers to entry, emphasis on outreach and fostering innovators. The study found that project management and guidance for innovators were the most critical features of the innovation program. Business and project planning increase the success of innovation programs. Business planning ensures a fit between the innovation idea, the strategy and the competencies of the organization and project planning outlines the progress of a program (79).

Innovation process

Innovation process concerns the policies and the steps that are taken in (part of) the organization from the idea of the innovation to sustaining the innovation. Innovation process has been researched in five studies (39, 40, 57, 62, 66). Three studies researched and identified factors relevant for the innovation process: the availability of quantitative evidence, inter-personal and inter-organizational networks, role of champions and senior management, the existence of a favorable inner and outer context (40, 66), organizational constraints (39) and knowledge management (62). Atkinson et al. (39) examined two types of organizational constraints: heterarchical constraints (resistance from other professional groups and units in the organization) and hierarchical constraints (resistance from upper-level stakeholders and managers). The results demonstrate that teams address constraints at different stages of innovation by applying various tactics. Leal-Rodriguez et al. (62) studied the relationship between knowledge management and the effectiveness of the innovation process. According to them, knowledge management, defined as explicit and tacit

components of organizational knowledge, leads to better innovation outcomes. Two studies researched the total innovation process. Hyrkas et al. (57) developed and tested a co-creation model for collaborative innovation, in which companies and healthcare professionals co-create future healthcare services. The results show that collaboration requires careful preparation, sector-specific knowledge and active efforts throughout the entire process. Reed et al. (66) studied the total process of innovation in healthcare organizations from strategic planning to implementation and found that the process of innovation is most dependent on organizational culture and leadership.

Inter-organizational links

Inter-organizational links concern the relations of an organization with other organizations and how the organization uses these links to enhance innovation readiness. Inter-organizational links are researched in two studies (43, 53). Goes et al. (53) define inter-organizational links as "cooperative relationships among distinct but related organizations." The relationships between innovation and four different but nonexclusive types of interorganizational links were studied: 'structural links' (organization is affiliated to corporate framework), 'administrative links' (e.g., contract management), 'institutional links' (link with institutional and trade associations) and 'resource links' (e.g., resource exchange). Results show that inter-organizational links provide an opportunity to exchange capabilities and knowledge between organizations and to enhance understanding of environmental trends. Bunn et al. (43) studied the researchers' awareness of the organizational context in the collaboration of healthcare organizations and universities on innovating. The results show that to make scientific innovation research work in a healthcare setting, it is important for researchers to understand the experiences of staff, to engage them as active members of the research team and to support them to develop skills.

Climate for innovation

Climate for innovation concerns creating a supportive organizational environment that contributes to innovation readiness and focuses both at the team and organizational levels. The main factor consists of the sub-factors innovative organizational culture and room for learning.

Innovative organizational culture

Innovative organizational culture concerns the way employees collectively think, behave and believe in relation to innovation readiness and is researched in ten studies (20, 46, 55, 58, 60, 61, 65, 71, 72, 77). Innovative organizational culture is described as attitudes or behaviors of the team or the organization towards innovations (46, 55, 58). Jacobs et al. (20) highlight the extent to which employees perceive that innovation is expected and rewarded by the organization, whereas Joseph (60) and Nieboer et al. (65) highlight innovative culture as "conditions" in which employees are supported in innovation.

A variety of factors that strengthen innovative culture were mentioned in the studies. Organizational support was frequently mentioned (20, 46, 55, 60, 61, 65) and is defined as time, training, innovation-values fit (e.g., fit between the innovation and the values of innovation users) and implementation standards and policies. Investing in innovation standards and policies can be interpreted by employees as innovation being an organizational priority and contributing to a favorable perception of the culture of innovation (20, 61). Furthermore, management support (e.g., coaching, priority setting) and leadership (e.g., guidance and preparing staff for change) are mentioned to enhance an innovative culture (46, 55, 60, 61, 65, 77). An innovative culture is an environment that allows employees to inquire and question organizational practices (60), gives enough leeway to express creativity and allows employees to take risks, experiment and take advantage of opportunities (58). Knowledge about how employees perceive the innovative culture can be used by management to determine if a group or organization is ready for innovation (71). Somech et al. (72) detailed four dimensions of an innovative culture: vision, participative safety, task orientation and support for innovation. They studied team composition (combined individual creative personality and functional diversity), team creativity and climate for innovation and reported that team composition interacts with innovative culture.

Room for learning

Room for learning concerns an environment that encourages the organization and employees to learn, reflect and acquire the knowledge and skills contributing to innovation readiness and is researched in six studies as ‘capacity to learn and innovate’ (38, 44, 74) and ‘facilitation of learning’ (69, 75, 80). Capacity to learn and innovate was researched in three studies (38, 44, 74). The findings of Anvik et al. (38) demonstrate that everyday work practices of care professionals, besides planned learning situations, are an important point of departure for learning and innovation. Additionally, opportunities for people to reflect and learn at all levels of the organization as well as leadership that encourages employees to participate can increase the capacity to learn and innovate (74). Learning communities (group learning in innovation clusters) provide opportunities to learn and can reduce the time required to move innovations into practice (44). The facilitation of learning that enhances innovation readiness was researched in three studies (69, 75, 80). Zuber et al. (80) observed that tools for creating innovative solutions, such as brainstorms and prototyping, increase the creative innovation potential of employees. The role of space in facilitating innovation is studied by Saidi et al. (69). Attractive workspaces, different from the usual workplace, stimulate innovation through being “a space that enables interaction” because the productive interaction of different players inspires new ideas. Furthermore, the influence of team learning on the implementation of innovation was studied. The results show that team learning will improve if the learning needs of a team are explored before the implementation of an innovation (75).

Leadership for innovation

Leadership for innovation concerns the role of leadership of top and middle management to contribute to innovation readiness. The main factor consists of the sub-factors leadership style and middle manager's role.

Leadership style

Leadership style concerns the attitude and behavior of managers in leading the way to become innovation ready. Leadership style is researched in three studies (54, 64, 68). Transformational leadership, directed at inspirational motivation of employees by expressing a compelling vision (54), has a positive influence on the innovative behavior of employees (54, 64, 68), while transformational leadership encourages employees to think and solve problems innovatively (64). In addition to transformational leadership, situational leadership (e.g., active participation from leaders) was considered important by staff as "leaders need to be present on the wards and know the skills of their employees" (68). Gunzel-Jensen et al. (54) studied the interaction between different styles of leadership (transformational, transactional and empowering leadership) and reported that the combination of transformational and empowering leadership (aimed at increasing employees' ability to make autonomous decisions when doing their job) has a strong positive influence on innovative behavior.

Middle manager's role

The middle manager's role concerns the responsibilities and motivation of middle managers for innovation readiness. The role is assessed in five studies (42, 45, 49, 51, 76). Middle managers are important to make innovation implementation happen (49, 76), but their variety of roles and limited decision-making authority with respect to implementation hinders their innovative capacity (76). García-Goñi et al. (51) studied the relation between motivation towards innovation and the involvement in the innovation process. As managers are more involved in the innovation process than other health professionals, they feel more motivated for the innovation than front-line employees. Chuang et al. (45) reported that middle manager support is encouraged by the fit between the innovation and the managers' workplace priorities in combination with control over the implementation. Furthermore, Birken et al. (42) and Chuang et al. (45) reported that top managers can enhance middle manager commitment by expressing to middle managers that innovation implementation is an organizational priority and allocating policies and resources accordingly. In return, middle managers can utilize this support by asking for extra assistance in the execution of the innovation strategy (42).

Commitment to innovation

Commitment to innovation concerns organizational actions aimed at the attitude, training and development of individual employees to support them in their individual readiness to get better at innovating. The main factor consists of the sub-factors innovative behavior and innovative competencies.

Innovative behavior

Innovative behavior concerns employees undertaking innovative actions contributing to innovation readiness and has been researched in four studies (48, 67, 73, 81). Innovative behavior is stimulated by managerial support (e.g., motivation, rewards), cultural support (innovative climate) (48) and distributed leadership (leaders distribute leadership to employees and leave work decisions to employees) (81). Furthermore, high-involvement HRM practices (e.g., training and development, performance feedback) positively influence innovative behavior as “employees perceive HRM practices as signals from the organization that innovative behaviors are appreciated” (67). Organizational commitment and autonomy (feelings of control regarding one’s work) positively influence this relationship. Taylor et al. (73) studied the resourcing of innovation when employees innovate outside the context of innovative programs when resources are scarce. The results show that, where employees are driving innovation, they mobilize already present space, funding and staff at all levels of the organization and that the support of senior staff is crucial in facilitating access to resources.

Innovative competencies

Innovative competencies concern the skills and motivation of employees to contribute to the innovation readiness of the organization and has been researched in two studies (47, 78). An increase in individual competences necessary for the use of information technology, typically a non-core competence of healthcare workers, resulted in a higher organizational ability to innovate (47). Weatherford et al. (78) studied knowledge, skills and attitudes specific for leaders of innovation in healthcare to set up an education plan for innovation leaders. Five competency domains for leaders of innovation were identified: disruptive change (positive open attitude toward change), experimentation and design thinking, innovation and creativity, translating innovation into operations and risk taking.

Discussion

Our study identified 10 sub-factors contributing to the innovation readiness of healthcare organizations that were clustered into four main factors: strategic course for innovation, climate for innovation, leadership for innovation and commitment to innovation (Figure 2). Climate for innovation (n=16) was the most studied, followed by strategic course for innovation (n=13). Leadership for innovation (n=8) and individual commitment to innovation (n=6) were the least studied, despite the importance assigned in the literature to healthcare staff at all levels as key players in the development and implementation of innovations (73, 82, 83). The factors found in this review show overlap with the literature about factors contributing to innovation readiness in business (84, 85) and healthcare (17). The theme strategic course for innovation is reflected in elements such as innovation strategy (17, 84), project management (84) and planning (85). Climate for innovation is reflected in elements such as the culture (17, 84) and context of the organization (85), whereas leadership

for innovation is reflected in leadership (17) and commitment to innovation in support (85) and competencies (17). Despite the overlap, there are also differences. Adams et al' s framework of the innovation management process (84), the ISO Innovation management system (85) and Nauta et al' s healthcare innovation management model (17) display portfolio management and internal and external communication as factors contributing to innovation readiness.

The majority (almost 90%; n= 36) of studies have been conducted since 2011, indicating that research into the innovation readiness of healthcare organizations is a rather new field. According to Weiner et al. (4), management consultants have written about organizational readiness for decades, although scientists have only recently focused attention on the importance of organizational readiness in supporting innovation in health settings. The author's diverse personal and professional backgrounds reflect the fact that research into innovation readiness is conducted by various disciplines among which are health policy and management, innovation implementation, entrepreneurship, healthcare education, leadership, learning, medicine and art & design. This scoping review shows that the concept of innovation readiness in healthcare is described in the literature with a variety of terms and there does not seem to be a generally accepted definition of innovation readiness. Furthermore, it reveals that the likely interplay within and between the four main and sub-categories contributing to innovation readiness are understudied and understanding their interplay will support organizations in becoming better at innovating.

Hardly any theoretical frameworks encompassing innovation readiness were used in the reviewed studies. Almost half of the studies (n=19) in this scoping review were performed in hospitals. The other half of the studies were undertaken in a variety of healthcare settings (e.g., nursing homes, mental health institutions, primary care and public health). Organizational characteristics (such as facility size), market characteristics (such as competition) (86, 87) and the educational level of staff (86) are found to influence innovative activities of organizations and might explain the larger representation of hospitals in this review. The question is whether research findings about innovation readiness can be transferred from one context to another. Besides the above-mentioned characteristics, the external setting and the roles played by external stakeholders (e.g., regulators) will impact the measures that organizations need to take to become innovation ready (88-92). It might be worthwhile understanding how innovation readiness differs over the diverse contexts in healthcare.

Of the 44 studies reviewed, 21 researched factors contributing to innovation readiness in the implementation stage of the innovation process. The main stages of an entire innovation process are described as idea generation, idea selection, solution development, implementation, scale-up and diffusion (17). Opportunities for innovation are sought, selected and developed in the first stages. In the implementation phase, the innovation is put into practice by healthcare professionals (93). In the last stage, actions are taken to support full scale spread of the innovation in the organization. The focus in research on the implementation of innovations is reflected by the attention

in research to heavily cited implementation models (Rogers (94) and Greenhalgh et al. (6)) and in international peer-reviewed journals on the implementation of research. The emphasis on an evidence-based approach in care might have provoked an impulse for the implementation of innovation, although experience revealed that innovations developed elsewhere cannot simply be implemented in any other context (95). Furthermore, the focus might be explained by the funding of national and regional governments to enhance the implementation and up-scaling of innovations to benefit specific target groups (10, 40, 96). “A company’s capacity to innovate is only as good as the weakest link in its innovation value chain” (97). Consequently, understanding innovation readiness in healthcare might benefit from research encompassing every stage of the innovation process.

This study has several strengths and limitations. In terms of strengths, it offers a unique contribution by presenting the state of the knowledge reflected in peer-reviewed literature from empirical studies, on factors contributing to innovation readiness in healthcare organizations. The study used a transparent and replicable review process. However, our study presents some limitations. First, it is subject to publication bias, since we only included studies published in peer-reviewed journals and excluded gray literature. Second, as there is no clear and consistent definition of innovation readiness, related search terms used for the search strategy can cause selection bias due to searching for specific words within the selected databases. Selection bias in the selection of studies was prevented by considering a broad range of words in relation to innovation readiness and reflection in the research team. Third, all but two studies (Pakistan and South Africa) were performed in the developed world and may impose a limitation on the findings of the study. The study increased the understanding of the determinants of innovation readiness and can support managers in healthcare organizations to decide on how to manage their efforts to become better at innovating.

Conclusions

This scoping review has summarized four main factors contributing to innovation readiness in healthcare organizations: 1) strategic course for innovation 2) climate for innovation 3) leadership for innovation and 4) commitment to innovation. The factors contributing to innovation readiness (Figure 2) seem to correspond to factors known in the literature. Research into the innovation readiness of healthcare organizations is a rather new field and lacks a generally accepted definition of innovation readiness, as well as a theoretical framework to guide research into innovation readiness. Future research could be directed towards defining the concept of innovation readiness and the development of a framework for innovation readiness to support managers in diverse healthcare settings to meet the challenges that healthcare organizations face. This review contributes to the first stage of theory building on factors contributing to innovation readiness. However, a better understanding of the interplay of factors contributing to innovation readiness in all stages of the innovation process and in diverse healthcare settings is needed.

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Appendices

Appendix 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

Section	Item	Prisma-ScR checklist item	Reported on page #
Title			
Title	1	Identify the report as a scoping review.	1
Abstract			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/ objectives lend themselves to a scoping review approach.	3
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4
Methods			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a web address); and if available, provide registration information, including the registration number.	Not applicable
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	5
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Appendix 2
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	5
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	6
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	6-7

Section	Item	Prisma-ScR checklist item	Reported on page #
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	not performed
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	7
Results			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	6
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	8-11, table 1&2
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	not performed
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	8-18
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	8-18
Discussion			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	19-20
Limitations	20	Discuss the limitations of the scoping review process.	20-21
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	22
Funding			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	23

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).
From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

Appendix 2. Detailed search terms used in the PubMed search*

Step	Search terms
1	Concept term: innovation readiness
	"change read*"[Text Word] OR "change capabilit*"[Text Word] OR "change capacit*"[Text Word] OR "dynamic capa*"[Text Word] OR "innovation capacit*"[Text Word] OR "innovation capabilit*"[Text Word] OR "Innovation management"[Text Word] OR “innovation maturity"[Text Word] OR "innovation performance*"[Text Word] OR "Innovation potential"[Text Word] OR "Innovation process*"[Text Word] OR "innovation read*"[Text Word] OR “innovation transformation*"[Text Word] OR "organizational capacit*"[Text Word] OR "organisational capacit*"[Text Word] OR "organizational capabilit*"[Text Word] OR "organisational capabilit*"[Text Word] OR "Organizational innovativeness"[Text Word] OR "Organisational innovativeness"[Text Word] OR "Organizational potential"[Text Word] OR "Organisational potential"[Text Word] OR "organizational read*"[Text Word] OR "organisational read*"[Text Word] OR "System readiness for innovation*"[Text Word] OR "readiness for innovation"[Text Word] OR "diffusing innovation*"[Text Word] OR "Innovation implementation"[Text Word] OR "innovation diffusion*"[Text Word] OR "implementation of innovation*"[Text Word] OR "innovation adoption*"[Text Word] OR "adopt innovation*"[Text Word] OR "health care innovation*"[Text Word] OR "healthcare innovation*"[Text Word] OR "hospital innovation*"[Text Word] OR "organizational innovation*"[Title/Abstract] OR "organisational innovation*"[Title/Abstract] OR "Diffusion of Innovation*"[Title/Abstract]

* Detailed search strategies used in the other databases (Cinahl and Web of Science) are available upon request

CHAPTER

3

Factors enabling innovation readiness of long-term care organizations: stakeholder opinions

This chapter was published as:
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Abstract

Background

Increasing innovation readiness of long-term care organizations for older adults is vital to ensure future provision and affordability of care delivery.

Purpose

This study sought to gain insight into factors that contribute to innovation readiness and addresses the following research question: What factors contribute to the innovation readiness of long-term care organizations for older adults?

Methodology/approach

Semi-structured interviews were conducted with 16 stakeholders connected to long-term care in the Netherlands: academics, (top) management, innovation managers, and consultants. A thematic content analysis was used to analyze the data.

Results

Four main factors were identified that contribute to the innovation readiness: 1) a clear strategic course for innovation, 2) a tailored innovation journey, 3) inspirational leading for innovation, and 4) hands-on-learning for innovation. Stakeholders highlighted that innovation readiness should not be developed as an ad hoc initiative but should be embedded in corporate strategies and decision-making processes. All stakeholders mentioned the importance of 'preparing' the organization for innovation readiness and professional 'learning for innovation'.

Conclusion

This study provides a step toward evidence-based factors, presented in a general framework, that contribute to the innovation readiness of long-term care organizations for older adults. Future research could verify the findings of this study and develop a scan, based on this study's innovation readiness factors, indicating the maturity of long-term organizations for older adults.

Practice implications

To become more innovation ready long-term care organizations are encouraged to embed innovation readiness into their corporate strategies and decision-making processes, to integrate learning into daily activities, and to collaborate with stakeholders.

Introduction

As societies age, pressure grows to ensure the future provision and affordability of long-term care (1, 2). Long-term care organizations for older adults provide a range of services, including medical and nursing care, housing, personal care, assistance, and social services to older adults who are unable to live independently (3). Challenges such as technological change and labor resource scarcity demand alternative ways of organizing and delivering long-term care (1).

To better deal with these challenges, long-term care organizations for older adults are investing time and budget in innovation (4). Greenhalgh et al. (5) describe innovation as “a novel set of behaviors, routines, and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost-effectiveness, or user experience, and that are implemented by planned and coordinated actions.” This definition shows that innovation means changing the way an organization works as a whole, not just adding one new idea or project.

Although long-term care organizations show great potential for innovation (6), many struggle to do this in a professional way (1, 4). Organizations that are innovation ready are more capable of implementing innovations (7). ‘innovation readiness’ indicates the level of maturity of an organization to succeed in any type of innovation (2), and long-term care organizations for older adults might benefit from more knowledge about how to become innovation ready (8). The importance of being ‘innovative’ for a long-term care organization has become broadly recognized in practice and in the literature, although there is limited evidence of what it takes to become innovation ready (5, 9). Recently, a scoping review (2) on studies into innovation readiness of healthcare organizations, summarized 4 main factors that may lead to innovation readiness of healthcare organizations: 1) strategic course for innovation, 2) climate for innovation, 3) leadership for innovation, and 4) commitment to innovation. These main factors emerged primarily from studies in hospital and primary care settings. It remains unclear whether they fully capture what is needed in the long-term care sector to become better at innovating, where different dynamics may apply. The transferability of these factors to long-term care might thus be limited. Additionally, it is anticipated that there might be additional factors enabling innovation readiness in day-to-day practice, such as innovation infrastructure and the capacity to monitor and evaluate (10). In particular, recent studies suggest that elements such as innovation infrastructure (e.g., dedicated teams, structured routines, it support) and the ability to monitor and learn from innovation efforts (e.g., feedback loops) may be essential in long-term care but are underrepresented in existing models (11). Against this background, there is a need to obtain more insight into the factors that might lead to innovation readiness of long-term care organizations for older adults (10). Innovating in long-term care is complex, multi-dimensional, and involves many parties, each having their viewpoints (10, 12). Additional research is needed to explore stakeholder perspectives on the factors that enable organizations to improve their innovation readiness, as such insight is still lacking in the context of long-term care (13).

Theory

Situating innovation readiness

Research into the innovation readiness of healthcare organizations is a rather new field (2). The literature describes several concepts that relate to what makes organizations successful at innovation, for example: (organizational) readiness for innovation, innovation capability, and innovation capacity (14-16). Innovation readiness differs from these concepts by its focus on the degree to which an organization has organized and prepared key factors to be successful in the entire innovation cycle. In contrast, these concepts target specific innovation stages: innovation capability focuses on development (15), while organizational readiness for innovation and innovation capacity focus on implementation (14, 16).

Our scoping review, aiming to clarify the concept of innovation readiness and to identify available research on the factors contributing to innovation readiness in healthcare organizations, (2) revealed that there is not a generally accepted definition of innovation readiness. The concept of innovation readiness remains conceptually underdeveloped and lacks operationalization in the context of healthcare management research. Based on literature in business en healthcare, we defined innovation readiness as the maturity level of an organization to succeed in any type of innovation and encompasses the entire innovation cycle (2). By the entire innovation cycle, we refer to all phases: idea generation, idea selection, solution development, implementation, scale-up, and diffusion (17). While innovation types vary, they generally fall into three main categories: social, technological, and process innovations.

In our view, innovation readiness represents a proactive orientation: not just readiness to adopt a specific innovation, but the maturity to continuously engage in and sustain innovation over time (2). This places innovation readiness within a broader view of how organizations build the ability to adapt and grow by developing processes and structures that help them adjust when needed (18).

Innovation readiness framework

The number of included studies found in the scoping review was limited (n=44), with most studies conducted in hospitals and focused on becoming ready for implementation. In searching for factors contributing to innovation readiness, we found no conceptual framework for healthcare (2). To enable long-term care organizations to improve their innovation readiness, an overview of key factors enabling innovation readiness in their context is needed (10). Furthermore, a framework could support researchers in understanding how innovation readiness relates to the success of healthcare organizations in responding to societal challenges. Such an insight is still lacking (19). The scoping review did reveal a preliminary set of main factors contributing to innovation readiness in healthcare organizations: 1) strategic course for innovation, 2) climate for innovation, 3) leadership for innovation, and 4) commitment to innovation. This research

aims to complement this set of factors by empirically exploring how a diverse group of long-term care stakeholders interpret and operationalize factors that enable innovation readiness. The factors identified in the scoping review will inform the development of our interview guide and serve as an initial coding frame for thematic analysis.

By collecting and analyzing stakeholders' perspectives via interviews, we intend to identify an overview of factors that can inform a conceptual framework, offering a structured and practice-oriented approach that enables managers and their organizations in long-term care to act upon key factors contributing to innovation readiness. This expanded innovation readiness framework might serve both as a diagnostic lens to assess an organization's current maturity level for innovation (5, 11) and as a developmental framework that guides future innovation structures and processes over time (2, 7). By providing a shared terminology and structured guidance, this framework advances both theoretical understanding and practical approaches to organize for innovation readiness in long-term care.

Method

This is a qualitative study into the opinions of dutch stakeholders on factors enabling long-term care organizations for older adults to become innovation ready. Semi-structured interviews were conducted as an approach to access in-depth information and encourage the respondent to tell 'the story' in their own words.

Eligibility and recruitment of respondents

Interview respondents were identified through a purposive sampling approach. They were recruited through the network of the research team and via snowball sampling of initial contacts. Over 50 persons were initially identified and finally, 16 were recruited through direct invitation. Respondents were not selected if, for example, geographical locations overlapped or because of job changes. Respondents were included if they 1) were researchers or professionals with academic or practical knowledge in the field of innovation and 2) were able to articulate viewpoints on factors important for innovation readiness of long-term care organizations for older adults in the Netherlands.

To ensure representation of the diverse views held by the respondents, we recruited for diversity in two aspects. We sought to include 4 groups of roles in long-term care organizations for older adults 1) academics, 2) (top) management, 3) innovation managers, and 4) individuals guiding organizations in making them 'innovation ready' (eg, consultants in government and commercial organizations). We expected that the different stakeholders would, depending on their position (e.g., strategic, tactical, or operational) and role (academic, management, innovation manager, or consultant), express different viewpoints. Further, we sought access to respondents in organizations spread over the Netherlands. The sex and gender of the respondents were not taken into account in the design of the study, as no potential implications of sex and gender on the study results and analyses were expected (20). Respondents were invited by personal

contact, by email (if an email address was publicly available), or by social media (LinkedIn). All contacted respondents were asked if they regarded themselves as knowledgeable to articulate their viewpoint, and all responded positively to the interview invitation.

Data collection

The 16 semi-structured interviews were held in Dutch from June 1 to September 30, 2022. The interviews took place with the written consent of each respondent, were audio recorded, and transcribed verbatim. The interview guide consisted of open-ended questions on the description of innovation readiness, factors enabling innovation readiness, and the impact of the setting of long-term care organizations providing care for older adults on innovation readiness (Table 1). The topic list was based on a comprehensive scoping review, providing a broad overview of factors contributing to innovation readiness in healthcare organizations, including long-term care organizations (2). The interview guide was piloted in two trial interviews and adjusted according to the feedback. Each interview started with an explanation of the interview's purpose and process, followed by open-ended questions. The first question was aided by the selection of photocards (21) to uncover respondents' descriptions of innovation readiness of long-term care organizations for older adults. Previous research on factors enabling innovation readiness of healthcare organizations (2) aided the interviewer at the end of the interview to refer to specific factors if they were not mentioned by the respondent. All interviews were conducted by the first author (MWH).

Table 1. Interview guide (semi-structured) for stakeholders in long-term care for older adults

1.	Can you choose 1, 2, or more photocards that, in your eyes, display innovation readiness best? How would you describe innovation readiness in your own words?
2.	Some long-term care organizations are good at innovating; what are the factors that contribute to this in your opinion?
3.	How does this (these) factor(s) support, enable, or contribute to innovation readiness?
4.	Does the setting of long-term care have an impact on innovation readiness of long-term care organizations?
5.	Is there any other factor, feature, element, or point of attention around innovation readiness that we have not discussed, but that in your opinion is important?

Data analysis

The method of analysis chosen was thematic content analysis. Four interview transcripts (one from each respondent group) were coded independently (by MWH, AB), and a set of preliminary codes based on previous research on innovation readiness (2) functioned as an initial coding frame. Comparison and discussion, until consensus was reached, resulted in a modified coding frame (in Maxqda software). Descriptions of the main

and sub-codes and excerpts typified the content for that code. The modified coding frame allowed for new codes to emerge and was adjusted as a result of coding the 12 remaining interviews. In the next step, clusters of codes were grouped into themes, and connections between the themes were explored. Discussion in the research team led to fine-tuning of the coding frame.

Demonstrating rigor

For the trustworthiness of this qualitative study, we paid attention to credibility, transferability, dependability, and confirmability (22). Credibility and transferability were promoted by selecting 4 respondent groups (active in diverse roles) from organizations (different in location) in the Netherlands with knowledge and experience of innovation readiness in long-term care settings for older adults. Stakeholders were selected through well-defined inclusion criteria via recruiting through the network of the research team and snowball sampling. To present a variety of perspectives on factors enabling innovation readiness 4 groups of roles in long-term care organizations were selected: academic, management, professional, and consultant (Table 2). Furthermore, these stakeholders were sourced from different levels within the organization, e.g., top management and innovation managers (staff and middle management). Besides that, stakeholders both from within organizations (management and professional) and stakeholders active in the broader context of long-term care (e.g. academics and consultants) were selected to represent the broad variety of perspectives. To capture the diversity of the factors enabling innovation readiness (content validity), the 10-step methodological protocol (23) (Appendix 1) was followed to achieve and assess saturation. The description of the research method is extensive (dependability), and during the analysis process, memos with interpretations of the data were recorded in a logbook to facilitate other researchers in repeating the work (confirmability).

To enhance the quality of the data collection, the interviewer used an interview guide (Table 1) and listened intensively during the interviews (which were audio-recorded and transcribed verbatim). To promote analytic integrity, the collection of the data and the analysis were done simultaneously. To enhance coding reliability and coding consistency, two authors (MWH, AB) performed the coding, and 4 interviews (one interview per respondent group) were coded independently by these two authors. The other 12 interviews were read, coded, and discussed. To enhance the quality of the analyses, the interpretation and analysis of the data were discussed within the research team.

Ethical issues

The study received ethical approval from the Medical Ethics Board of Zuyderland Medical Center in the Netherlands with the number METCZ20220036. Permission to conduct the interview for this study was granted by each respondent personally. Respondents were made aware of the study objectives, and written informed consent was obtained from respondents before the beginning of the interviews.

Results

Characteristics of the respondents

The 16 interviews took place either face-to-face at respondents' workplaces (n=13) or online (n=3) and lasted between 60 and 90 minutes. An overview of respondent characteristics is shown in table 2.

Factors enabling innovation readiness

We identified 4 main factors that, according to the respondents, might lead to innovation readiness in long-term care. Each main factor entails 2 or 3 sub-factors. Based on these findings, we present 10 sub-factors that might lead to innovation readiness (Figure 1).

Table 2 characteristics of participating respondents

No.	Group	Type of organization	Main role of respondent
1.	academics	University	Academic
2.	academics	University of applied sciences	Academic
3.	academics	National centre of expertise for long-term care	Academic
4.	academics	Dutch healthcare authority	Academic
5.	(top) management	Long-term care[a] (€102 M, 2900 employees)[b]	Director
6.	(top) management	Long-term care[a] (€75 M, 1800 employees)[b]	Director
7.	(top) management	Long-term care[a] (€47 M, 1560 employees)[b]	CEO
8.	(top) management	Long-term care[a] (€244 M, 5500 employees)[b]	CEO
9.	innovation manager	Long-term care[a] (€152 M, 4000 employees)[b]	Innovation manager
10.	innovation manager	Long-term care[a] (€176 M, 2900 employees)[b]	Program manager innovation
11.	innovation manager	Long-term care[a] (€189 M, 2300 employees)[b]	Program manager innovation
12.	innovation manager	Long-term care[a] (€305 M, 5600 employees)[b]	Innovation manager
13.	consultants	Independent	Innovation coach
14.	consultants	Independent	Consultant
15.	consultants	Care administration office	Manager
16.	consultants	Client organization	CEO

[a] long-term care organization for older adults providing medical and nursing care, housing, personal care, assistance, and social services to older adults who cannot live independently
[b] annual reports 2023

Clear strategic course for innovation

A clear strategic course for innovation refers to the organization's long-term direction to become innovation ready. It articulates the role and the importance of innovation for the organization and defines the allocation of resources. According to the respondents, having a clear strategic course for innovation enhances the ability to address future challenges, implement innovations successfully, and expand the support of care professionals for innovation decisions: *"you have to prepare upfront…you have to decide on your envisioned direction and the budget you intend to invest"* (respondent 1, academic). This main factor consists of the 3 sub-factors 'focused innovation strategy', 'organized for innovation', and 'informing innovation communication'.

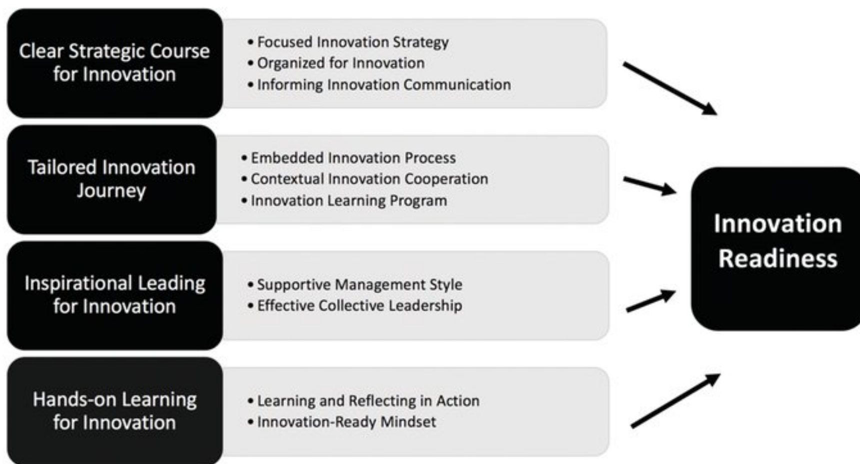

Figure 1 factors enabling innovation readiness (based upon this study's findings)

Focused innovation strategy

Focused innovation strategy concerns the organization's activities in formulating strategic objectives and choices regarding innovation that serves as a framework for decision-making around innovation: *"we have defined several innovation themes based on our long-term direction against which innovation activities are reviewed*" (respondent 6, (top) management). Most respondents (n=14) mentioned the relevance of an innovation strategy and pointed out the need to take the organizations' goals as a starting point. In their eyes, the objective of an innovation strategy is to create conditions that facilitate innovation and enable care professionals to innovate. The respondents linked developing an innovation strategy with defining the innovation ambition: *"from your strategy originates your ambition which defines your type of innovation"* (respondent 1, academic).

Organized for innovation

Organized for innovation concerns the conditions prepared by the organization to implement the innovation strategy. Thirteen respondents pointed out that, to become innovation ready, the innovation strategy should be embedded in a coherent set of organizational elements. According to them, a multiannual innovation roadmap for the execution of the innovation strategy is especially valuable, as it ensures quick decision-making on innovation opportunities: *"innovation readiness is about having a strategy, policies, processes, focus—knowing what's going on and about making choices"* (respondent 11, employee). Respondents considered it relevant to organize the following aspects to become innovation ready: Finance, HRM, and ICT infrastructure; teams that are diverse in terms of function and discipline; and easily accessible support (organizational and technical). Most respondents mentioned that their organization assigned innovation teams (also referred to as a platform, committee, or community) with the responsibility to organize strategic, tactical, and operational innovation activities. These teams perform activities such as setting the innovation agenda, decision-making on innovation execution, retrieving innovation questions, and guiding innovation processes.

Informing innovation communication

Informing innovation communication concerns corporate communication about the innovation strategy, projects, and results to internal and external stakeholders. Fourteen respondents mentioned that innovation communication gives employees, clients, relatives, and the external network insight into the progress and results of innovations. Stakeholders might thus be motivated to become involved in innovation. In the eyes of the respondents, communication about innovation should highlight how the organization is structured for innovation, the innovation methods, the innovations chosen for implementation, and the innovation's added value for the stakeholders: *"Yes, along the long-term vision, you have to be able to show we're getting results. To communicate to employees what innovations we chose, which we didn't, and why. But also towards the ceo: look this is the result of the investments we make together"* (respondent 9, innovation employee). The organization's intranet and internet, separate innovation websites, company visits, social media, and newsletters were cited as communication channels.

Tailored innovation journey

A tailored innovation journey concerns organizing innovation deployment to enable the strategic innovation course. In the eyes of the respondents, employees with a diversity of functions, disciplines, and hierarchical levels should be part of the innovation journey and be aware of what role in innovation is expected from them. According to respondents, innovation journeys are hard to control*: "an innovation journey doesn't dictate what innovation should be about. It's methodical working on innovation based on the innovation method you have chosen"* (respondent 11, innovation manager). This main factor consists of the 3 sub-factors 'embedded innovation process', 'contextual innovation cooperation', and 'innovation learning program'.

Embedded innovation process

An embedded innovation process concerns the steps that are taken in (parts of) the organization from the development of an idea to sustaining the innovation. Thirteen respondents mentioned the following elements of the innovation process as relevant: decision-making on innovation, collecting feedback from stakeholders, and use of innovation methods and tools. *"methodical working on innovation means that you work in a structured and documented way. You can use existing tools such as appreciative inquiry or design thinking"* (respondent 2, academic). The respondents highlighted that the process should fit the type of innovation, ranging from a small improvement to a disruptive innovation. According to respondents, guiding and screening innovations via a pre-agreed process helps the organization to bring out, execute, and decide on proceeding or terminating innovation opportunities that best fit the innovation strategy.

Contextual innovation cooperation

Contextual innovation cooperation concerns collaboration to acquire knowledge to enhance innovation readiness: *"yes, i actually think that organizations should bring some external expertise on innovating to make it work in daily practice"* (respondent 14, consultant). All 16 respondents mentioned the importance of interaction with internal and external stakeholders consisting of clients, relatives, employees, municipalities, regional long-term care organizations, knowledge institutions, care administration offices, government, and broader society. They indicated that networks are valuable to sharpen the strategic direction of the organization and to form strategic partnerships to collectively tackle innovation challenges. Besides that, the respondents mentioned that partnerships and cooperation with knowledge institutions and other long-term care organizations provide an opportunity to share and exchange knowledge between science, practice, and policy.

Innovation learning program

An innovation learning program concerns developing a vision and a plan to increase innovation readiness via learning and reflecting. All 16 respondents referred to the value of a program to facilitate learning about and from innovating. Aspects of a learning program that were mentioned: a vision on learning how to innovate, design of a work environment that promotes innovation, provision of time and training for internal innovation talents, training on innovation tools and methods, and leadership training for management. *"we really take learning experiences into account to increase innovation readiness of the organization"* (respondent 7, (top) management). All respondents pointed out the importance of time to innovate and in more detail mentioned 'time to think about innovating' for management, as well as 'time to be involved in innovation' for healthcare professionals and employees from support departments. Although the respondents sketched that long-term care organizations are taking steps toward building an internal knowledge infrastructure for innovation readiness, they mentioned that the 'capacity to learn' is not nourished and is underexposed in their organizations.

Inspirational leading for innovation

Inspirational leading for innovation concerns the attitude, behavior, and motivation of employees in leading the way to innovation readiness: *“working on innovation, that is a responsibility for everyone at any position in the organization. So not working on innovation because someone tells you to, but because you see that innovations bring results”* (respondent 2, academic). This main factor consists of the 2 sub-factors ‘supportive management style’ and ‘effective collective leadership’.

Supportive management style

A supportive management style concerns the attitude and behavior of management in supporting innovation readiness. Fifteen respondents pointed out that the role of (top and middle) management is crucial in guiding, facilitating and stimulating the innovation journey: *“i’m putting my name on this innovative project. With that you indicate as a leader or as a manager, guys this is crucial for us as an organization”* (respondent 1, academic). They mentioned that (top and middle) managers stimulating innovation in the workplace motivates employees to experiment, and employees perceive this behavior as a signal from the organization that innovative behavior is appreciated. Managers can support the innovation process, according to the respondents, by starting innovation in teams that are ‘innovation enthusiastic’ and staying supportive when things go wrong.

Effective collective leadership

Effective collective leadership concerns employees with diverse skills working together toward jointly developed goals while leadership is felt and executed by all team members. Eight respondents mentioned ‘collective leadership’ and referred to employees showing intrapreneurship for their ideas and projects. To become innovation ready, an organization needs collective leadership, in the eyes of the respondents, as innovating is ideally a balance between bottom-up and top-down activities: *“acting as a collective will support the organization to become innovation ready”* (respondent 15, consultant). Furthermore, they outlined that working together on innovation is relevant, as it unlocks the shared intelligence that emerges from collaboration. Respondents mentioned that the organization can support collective leadership by having decision-making processes and policies in place.

Hands-on learning for innovation

Hands-on learning for innovation concerns the learning process of the organization and transforming the resulting knowledge into collective know-how on innovation readiness. In the eyes of the respondents ‘hands-on learning for innovation’ will increase the organization’s ability to address future challenges. *“the healthcare landscape changes… an organization can stay upright because you have gathered skills to use new developments to your advantage”* (respondent 9, employee). This main factor consists of the 2 sub-factors ‘learning and reflecting in action’ and ‘innovation-ready mindset’.

Learning and reflecting in action

Learning and reflecting in action concerns the organization and employees become better at innovating through learning and reflecting in practice while working on innovation. All but one respondent pointed out the importance of individual and collaborative learning and reflecting while innovating. *"learning is still very difficult. How can we go from our current focus of 'performing' to 'learning', as i find it crucial for innovation"* (respondent 10, employee). They indicated that becoming innovation ready involves, on the one hand, earlier accumulated knowledge of employees and, on the other hand, learning about and from innovation and sharing knowledge. Respondents mentioned organizational actions that support individual readiness for learning and reflecting: invitation of employees to participate in innovation, expressing trust in employees, and encouraging employees to be inquisitive. Furthermore, according to the respondents, the ability to interpret, adapt, and use what has been learned can be stimulated by applying acquired knowledge in one's workplace and taking time for unplanned conversations. Additionally, to make room for learning, teams can be invited to design and develop their own pilots and have experienced colleagues available to learn from. Moreover, respondents mentioned that learning across the organization can be organized via skills training, active recording of experiences, meetings to share learning experiences, and physical 'innovation spaces' to facilitate this.

Innovation-ready mindset

An innovation-ready mindset concerns the attitude, behavior, experiences, and motivation of employees that enable innovation readiness. All but one respondent pointed out that the organization benefits from 'innovation enthusiastic' people having a view that they can make productive. *"it starts with intrinsic motivation, yes, because that is what you need if you want to innovate as an organization"* (respondent 12, employee). According to the respondents, employees with an innovation-ready mindset make room for experimenting, will persuade colleagues and customers to embrace innovation, and might act as agents for colleagues to learn from. Respondents described 4 relevant elements of an 'innovation-ready mindset': 1) accept that risks are involved and therefore employees need to have courage and be able to learn (also) from failures, 2) work on the innovation journey with the intended added value in mind, 3) be patient (as innovation takes time), and 4) develop an exploring attitude and dare to ask questions. Respondents indicated that innovation readiness can be seen as 'the new normal' and involves taking risks. *"given the urgency, have the guts to take a road that hasn't been traveled before"* (respondent 4, academic). At the same time, respondents indicated that employees do not automatically adopt a 'learning to innovate' mindset, as long-term care employees have not been educated to do so and have a deep-seated fear of making mistakes.

Discussion

This study identified 4 main factors that contribute to the innovation readiness of long-term care organizations for older adults: 1) a clear strategic course for innovation, 2) a tailored innovation journey, 3) inspirational leading for innovation, and 4) hands-on-learning for innovation (figure 1). These findings for long-term care identify additional factors, in addition to those contributing to the innovation readiness of healthcare organizations studied in previous research (2).

The factors 'strategic course for innovation' and 'leadership for innovation'align with earlier findings on innovation readiness in healthcare organizations (2). The addition of the main factor 'tailored innovation journey' reflects the respondents' attention to preparing the organization for innovation readiness via the deployment of the innovation strategy. Furthermore, this study presents an additional main factor 'hands-on learning for innovation' that indicates the importance of learning about and from innovation for employees and the organization. Moreover, 2 additional sub-factors were revealed by the respondents: 'informing innovation communication,' to create awareness about the innovation activities of the organization, and 'innovation learning program', which expresses the need to envision how the organization is learning to innovate and sharing knowledge.

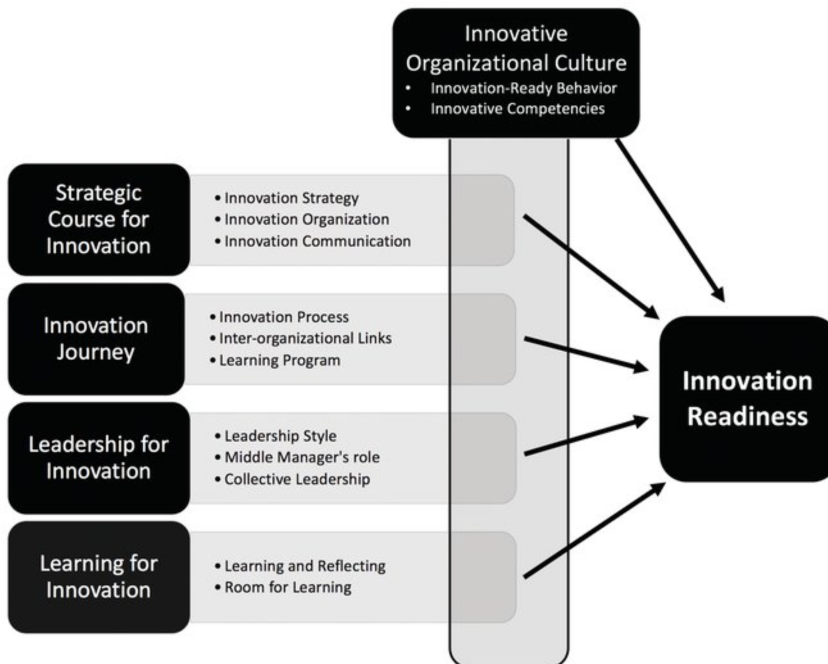

Figure 2 factors enabling innovation readiness (combining previous research (Van den Hoed et al., 2022) and findings from this study)

The findings of previous research (2) combined with this study result in 5 main factors: 1) strategic course for innovation, 2) innovation journey, 3) leadership for innovation, 4) learning for innovation, and 5) innovative organizational culture (combining commitment to innovate and climate for innovation). A general framework that represents the combined factors enabling innovation readiness is presented in figure 2 (combining previous research (2) and this study's findings).

Based on this study, it can be concluded that the interplay of main factors is vital for innovation readiness. This study's findings support the notion that innovation readiness benefits from an approach at the individual, team, organizational, and inter-organizational levels, although it does not provide insight into the contributions and interplay of the factors enabling innovation readiness. Furthermore, our findings indicate that some factors might be more conditional, such as an innovation roadmap, whereas others might play a more supportive role, such as physical 'innovation spaces'. Gaining greater insight into the contributions and interplay of factors might help long-term care organizations become innovation-ready.

Worth mentioning is the importance placed on 'preparing' the internal and external organization for innovation. According to the respondents, innovation readiness should not be developed as an ad hoc initiative but should be embedded in corporate strategies and processes. The factor 'strategic course' shows some overlap with the literature on innovation strategy in business (24) and healthcare (10). Herewith, the additional sub-factor 'innovation communication' is seen as relatively new (5). Innovation in long-term care is about changing behavior and routines to implement innovations (25). Respondents' attention to innovation communication underscores the importance of communication in supporting knowledge sharing and providing insight into the progress of innovations (26).

The factor related to 'leadership' from management has been described thoroughly in the literature as being relevant for becoming better at innovating (27). Studies in healthcare indicate that (top and middle) managers can enhance the success of innovations as they can ensure that the 'right' factors are in place during the innovation process (25). Although this role of managers and team leaders should shift from controlling to leadership that helps to initiate and amplify support for innovation, as mentioned by Uhl-Bien and Arena (28). Respondents' attention to the leadership factor for all employees is encouraging. They stressed 'collective leadership' as a source of innovation (29) by drawing on the strengths of employees (30). Collective leadership, a relatively young movement in the scientific literature, views leadership not as an individual capacity but as a form in which many people work together on issues beyond everyone's primary responsibility (31). Silva, Mininel (32) pointed out that the increasing complexity of healthcare requires leadership of multiple professionals to share viewpoints and knowledge. This study's findings endorse that all organizational levels, board, management, staff, and healthcare professionals, have to be involved in innovation readiness. Strategies for developing collective leadership in long-term care might be key to achieving innovation readiness across all levels in the organization (29).

Interestingly, all of the respondents viewed acquiring knowledge on innovating via cooperation and ‘learning for innovation’ as necessary. The importance of organizations learning from innovating corresponds to innovation management literature in business (24) and healthcare (33). (19) indicated that opportunities for reflection and learning at all levels make new ways of working more acceptable. Employees with an innovation-ready mindset are described by respondents as ‘intrapreneurs’, referring to long-term care professionals taking the lead in innovations. Verleye and Gemmel (34) concluded that, for the future of long-term care, it will be necessary to motivate all long-term care professionals to learn from innovating, regardless of discipline and function. Therefore, long-term care organizations for older adults need to make time for professional learning (35) and to install learning strategies (36).

Our study provides suggestions for management at long-term care organizations for older adults to become better at innovating. Foremost, management is encouraged to prepare the organization for innovation readiness by formulating the innovation course and subsequently organizing the necessary innovation processes. Furthermore, management should build a professional learning culture in which learning and development are self-evident and integrated into daily activities (36). Besides that, management should understand the impact of the wider policy environment (12) and collaborate with long-term care stakeholders and policy-makers to contribute to innovation readiness in long-term care. If the study's context would change to a different country or healthcare setting, results of this study may vary as a result of socio-cultural, economic, and institutional differences. Therefore, in terms of transferability, we will be unable to make any generalizations about the findings of this study to other contexts or settings.

This study has several strengths and limitations. In terms of strengths, this study is the first to explore stakeholders' perspectives on factors that may lead to innovation readiness in long-term care for older adults. The stakeholders were also able to share information from their perspectives and were not limited by answer options provided by the researcher. The interviews provided an opportunity to gather stakeholders' perspectives and yielded detailed information about factors that might lead to innovation readiness.

The study was conducted in the Dutch long-term care. Although the findings may be most relevant within this context, they may inform organizations and researchers working in healthcare settings by highlighting relevant dimensions of innovation readiness. Further researcher in other settings could help to test and refine the framework and support its transferability. The study was conducted using a transparent, replicable research process. However, our study also presents some limitations. Its results are subject to participant bias, because we included only 4 respondent groups. We did not include clients and relatives, based on the notion that articulating viewpoints on factors enabling innovation readiness might not be expected from them. Furthermore, this study is also subject to researcher bias, as the researcher performing the interviews and the analysis had previously acquired knowledge of a

scoping review on innovation readiness. Researcher bias was prevented by using a clear, piloted interview guide (Table 1) and by transcribing the interviews verbatim. The analysis of the interviews was done by 2 authors (AB, MWH) and discussed in the research team.

Practice implications

1. *Prepare the organization for innovating* - foremost, management is encouraged to prepare the organization for innovation readiness by formulating the innovation course and organizing innovation processes accordingly.
2. *Integrate learning into daily activities* - organizations should support managers to integrate professional learning into daily practice and facilitate learning from innovation advocates. Middle managers can contribute via creative ways to discuss learnings, facilitating open communication and sharing mistakes.
3. *Collaborate with stakeholders* - given that the environment outside long-term care organizations for older adults significantly influences innovation readiness, management should actively collaborate with long-term care stakeholders, knowledge institutions, and policy-makers.

Conclusion

This study provides a step toward evidence-based factors that contribute to the innovation readiness of long-term care organizations for older adults. This study's 4 main factors contributing to innovation readiness are substantiated by existing literature. Therefore, the findings of this study can support long-term care (top and middle) managers to structurally embed innovation. Research into the innovation readiness of healthcare organizations is a rather new field. A better understanding of the contribution and the interplay of factors enabling innovation readiness at all stages of the innovation process is needed. Furthermore, future research could be directed toward verifying the findings of this study and developing a scan, based on this study's innovation readiness factors, indicating the maturity of long-term organizations for older adults.

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Appendices

Appendix 1. Ten-step methodological protocol for specifying saturation

1.	define the underlying disciplinary framework	Academic discipline: health services research
2.	specify the target class precisely	4 respondent groups working in the long-term care setting
3.	show how respondents or cases were selected or excluded	Maximized diversity by ensuring respondents included diverse functional roles in long-term care organizations for older adults
4.	describe techniques to minimize inadvertent or indirect selection bias	Diversity of geographical location and size of the organization
5.	report homogeneity or heterogeneity of cases, compare focus of analysis	Same themes (main and sub-factors) are raised by each stakeholder group
6.	report processes for elicitation or extraction of information content	Semi-structured interviews (tabel i), conducted individually, in dutch, use of photocards; analyses performed on written text (based on audio recording)
7.	select code, meaning, or model saturation	Full code saturation was reached, as the last #4 interviews (from #16) contributed no new codes and did not change the coding tree
8.	specify code and concept fineness or granularity	Main factor involving the lowest amount of coded text contained 5 subcodes
9.	report order and randomization of cases in post facto tests of saturation	Case order was determined by the order of the interview date
10.	define the level of precision in post facto tests of saturation	All respondents contributed to the main factors of the coding tree

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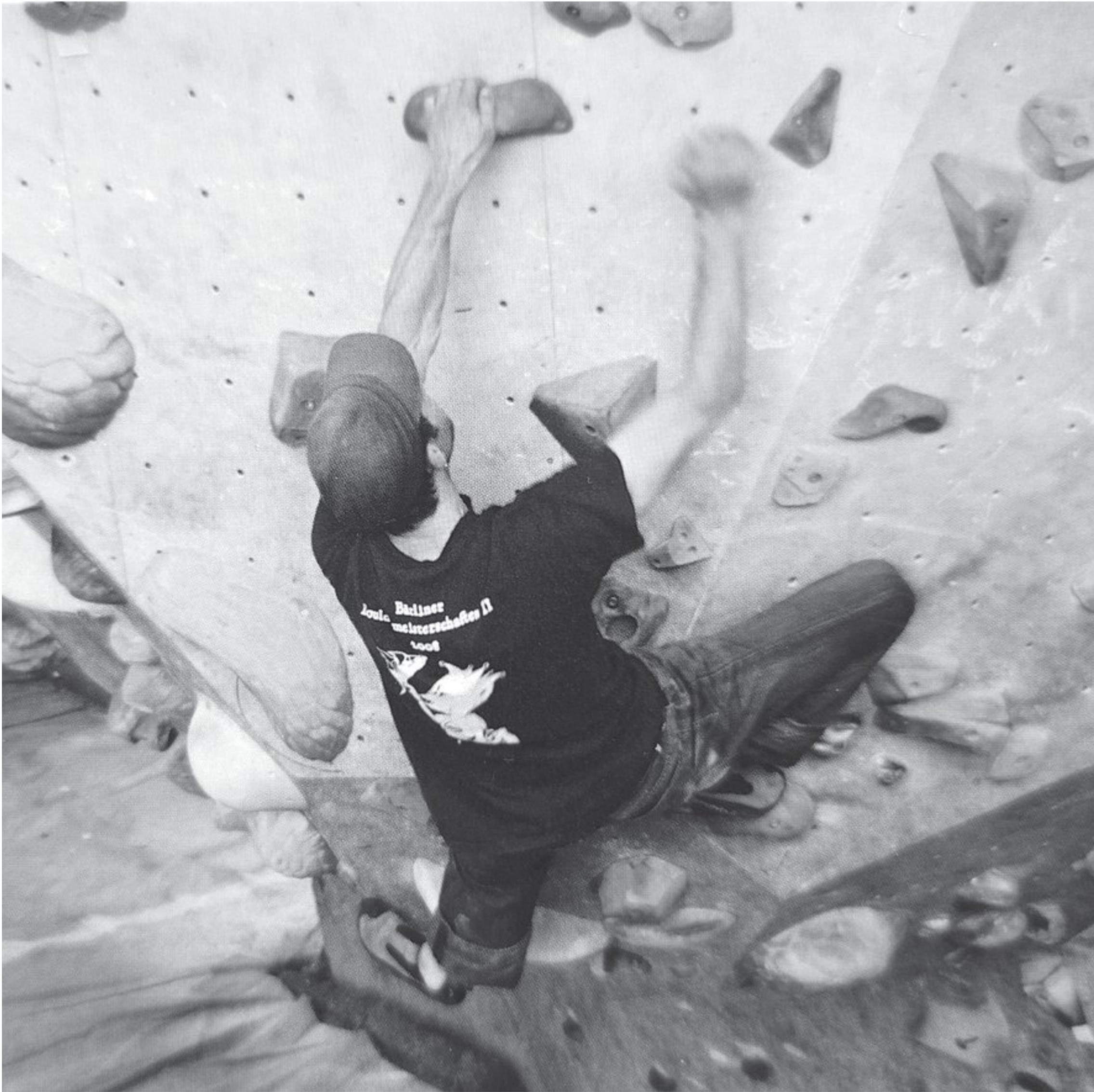
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CHAPTER 4

Perspectives on managing innovation readiness in long-term care: a Q-methodology study

This chapter was published as:
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Abstract

Background

The scarcity of resources in long-term care demands more than ever that organizations in this sector are prepared for innovation to ensure affordable access to care for older adults. Organizations that are innovation ready are more capable of implementing innovations. Therefore, a better understanding of how stakeholders view innovation readiness in long-term care can provide actionable strategies to enhance their innovative capacities. ‘Innovation readiness’ indicates the level of maturity of an organization to succeed in any type of innovation. Our study explored perspectives among stakeholders on what they consider important for organizations in long-term care for older adults to be innovation ready.

Methods

Q-methodology, a mixed-methods approach, was used to investigate the perspectives of 30 stakeholders connected to long-term care for older adults in the Netherlands: academics, (top)management, innovation managers, client representatives, staff, and consultants. Stakeholders were asked to rank 36 statements on innovation readiness on importance. Statements were extracted from literature research and qualitative interviews. Thereafter in the post-interviews stakeholders explained their ranking and reflected on the statements. By-person factor analysis was used to identify clusters in the ranking data. Together with the qualitative data from follow-up interviews, these clusters were interpreted and described as perspectives of the stakeholders.

Results

Four distinct perspectives were identified on what they consider important for innovation readiness in long-term care: 1. ‘supportive role of management’ 2. ‘participation of the client (system) and employees’ 3. ‘setting the course and creating conditions’ and 4. ‘structuring decision-making, roles and responsibilities’. The 36 statements represented a complete overview of innovation readiness factors. No additional innovation factors to those previously identified in the literature emerged from the interviews.

Conclusions

Stakeholders agree that all factors contributing to innovation readiness of long-term care organizations for older adults are accounted for. The variety of perspectives on what is most important shows there is no agreement among stakeholders about a fixed route toward innovation readiness. However, stakeholders suggested a temporal order of the innovation readiness factors, preferably starting with formulating the innovation ambition. This study’s results could contribute to developing an assessment tool to deliver a structured approach for managers to assess the innovation readiness of their organization.

Background

Long-term care organizations for older adults (e.g. care homes, nursing homes, assisted living facilities, residential aged care facilities) provide a range of services, including medical, transitional, and nursing care, housing, personal care, assistance, and social services to older adults who cannot live independently (1). Dutch long-term care is largely funded through mandatory public health insurance and is increasingly focusing on person-centered care, integrating technology (e.g., eHealth, telecare), and promoting self-management to enhance the quality of life (2). Complex care demands, nursing staff shortages, and scarcity of resources (3) demand more than ever that long-term care organizations are prepared for innovation to ensure affordable access to care for older adults (4-8). Greenhalgh et al. (9) see innovation as "a novel set of behaviors, routines, and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost-effectiveness, or user experience and that are implemented by planned and coordinated actions." Organizations that are innovation ready are more capable of implementing innovations (10-12). Thus, 'innovation readiness' indicates the level of maturity of an organization to succeed in any type of innovation (13). Innovation strategies such as utilizing technologies and implementing integrated care models are aimed at improving the care quality and efficiency of their services. Considering the challenges they face, long-term care organizations for older adults might benefit from more knowledge about how to become innovation ready (14-16).

The significance of promoting innovation within long-term care organizations has gained widespread acknowledgment both in the literature and in day-to-day practice (9, 17). Recent literature addresses innovation readiness within healthcare with a variety of words such as 'capacity for innovation' (18-21), 'innovation capacity' (22), 'capacity to innovate' (23-25), 'ability to innovate' (26-28), 'organizational innovativeness' (23), 'organization's innovation ability' (29), 'innovation performance' (30, 31), 'innovativeness of organizations' (32), 'organizational innovation' (33) and 'organization's innovative potential' (34). Insight into the conditions on how to become innovation ready remains relatively scarce (32, 35, 36). A recent study proposed a framework comprising five main factors enabling innovation readiness of long-term care organizations for older adults: 1) strategic course for innovation 2) innovation journey 3) leadership for innovation 4) learning for innovation and 5) innovative organizational culture (37). However, the importance of these factors seems to vary within the long-term care sector (32, 35, 37) and, therefore, it is desirable to gain a deeper understanding of the perspectives of stakeholders in this sector.

According to Nolte (14), innovating in long-term care takes place on a multi-level organizational perspective, requiring collaboration between locations, disciplines, teams, and employees, who all may have different challenges and distinct perspectives on how to become innovation ready (38). Research exploring the perspectives of the various stakeholders in long-term care on innovation readiness has not yet been undertaken (39, 40). Thus, our current study aimed to address this gap by investigating the perspectives

of stakeholders with a role in innovating in long-term care organizations on what is important for organizations in this sector to be innovation ready. In addition, we tested the comprehensiveness of the list of innovation readiness factors previously identified in the literature (37). The study had two research questions: 1. What are the prevailing perspectives on factors enabling innovation readiness among stakeholders with a role in long-term care for older adults? 2 Are there additional factors that contribute to innovation readiness?

Methods

Design: Q-methodology

We used Q-methodology to identify and describe perspectives on what is important for innovation readiness among stakeholders in long-term care for older adults. Q-methodology is a mixed-methods approach for systematically studying perspectives, opinions and beliefs. The 'Q' stands for 'quantification' of subjective data, with which the perspectives of individuals can be analyzed and interpreted in a systematic and structured manner (41-43). Q-methodology involves a card sorting activity to rank a set of statements (on innovation readiness), which are analyzed using by-person factor analysis to identify shared viewpoints in the data (42). Q-methodology is increasingly used in healthcare research and other disciplines for identifying and comparing individuals' and groups' perspectives (42, 44, 45). Our study was conducted in four main steps, as common to Q-methodology studies: 1. development of the statement set; 2. selection of respondents; 3. card-sorting and post-interview; 4. analyses and interpretation.

1. Development of the statement set

To capture the full range of perspectives on a specific topic adequately, the statement set presented to respondents should have good coverage of the subject of interest (41). For the development of a comprehensive overview of factors potentially contributing to the innovation readiness of organizations in long-term care, we used the results of a recent scoping review (13) and an interview study (37) on this topic, the scientific literature discussed here above, and statements from opinion leaders in the Netherlands related to innovation readiness (46, 47). Altogether, this resulted in a first set of 112 possible statements (the concourse (41)). To make sure all the potentially important factors for innovation readiness were covered, these statements were categorized according to the five main factors from the innovation readiness framework of Van den Hoed et al. (37). Via a group session with healthcare researchers of the Living Lab in Ageing and Long-Term Care at Maastricht University in the Netherlands and iterative discussions within the research team, a pilot set of 36 statements was selected for the study (the Q-set (41)). Face-to-face pilot interviews were organized to test the interview materials, including the statements (printed on cards), the sorting grid (Figure 1), the step-by-step instructions for conducting the card

sorting exercise and the interview guide, with five respondents (i.e., one top manager, one client representative, three innovation managers; duration approx. 60 minutes). The aim of the pilot was to evaluate if the statement set was comprehensive (48), whether all the interview materials were clear and accurate, and the time taken to complete the Q-sort interview. This pilot resulted in the rewording of four statements. The final set of 36 statements covering potentially important factors for innovation readiness of organizations in long-term care for older adults is presented in Table 1.

When a long-term care organization wants to become innovation ready than ……….

is least important				is neutral				is most important
-4	-3	-2	-1	0	+1	+2	+3	+4

Figure 1. Sorting grid

2. Selection of respondents

We anticipated that how stakeholders perceive the relative importance of factors contributing to innovation readiness might vary by function, role, geographical location, low to high level of experience with innovating (49), and size of the organization (50). Consequently, respondent recruitment aimed for diversity on these characteristics by approaching the following stakeholder groups: 1) academics, 2) (top) management, 3) innovation managers, 4) staff, 5) client representatives, and 6) consultants guiding organizations in making them ‘innovation ready’. Further, we sought access to respondents in smaller and larger organizations spread over the Netherlands. The sex and gender of the respondents were not taken into account in the design of the study, as no potential implications of sex and gender on the study results and analyses were expected (51). Potential respondents were identified through a purposive sampling (52) approach. They were initially recruited through the networks of the research team and, next, using snowball sampling via these initial contacts. Identified potential respondents were invited by personal contact, email

(if an email address was publicly available), or social media (LinkedIn). All contacted respondents were asked if they were familiar with innovation readiness, the topic of this study. We included respondents if they 1) were researchers or professionals with academic or practical knowledge in the field of innovation in long-term care for older adults and 2) were able to articulate perspectives on factors important for innovation readiness of long-term care organizations for older adults in the Netherlands and 3) had a professional role in innovating in long-term care organizations for older adults.

3. Card-sorting and post-interview

Respondents conducted the card-sorting task online via Q-method software, a computerized web-based application customized with content by the interviewer, allowing respondents to sort the statements online (53). Conducting Q-methodology studies online is feasible, especially due to increasing experience with online applications and software developments since the COVID-19 pandemic (54). Research questions, instructions, statement cards and sorting grid were presented via the software in real-time to respondents. The respondent was asked to share the screen with the interviewer during the card-sorting task and the interviewer gave verbal instructions for the task and answered questions, if needed. After the respondents were provided with the research question, they were asked to rank the statements. The sorting grid (Figure 1) consisted of 36 items with a numerical ranking from least important (- 4) to most important (+ 4) in a nine-point distribution, as is suggested for statement sets of 40 items or less to facilitate the ranking (41). The instructions for the task were presented on top of the sorting grid. Respondents were also encouraged to comment (to think-aloud) while they were sorting the cards to provide valuable information for the interpretation of the results (55). After the respondent had finished the sorting, the results were captured via a screenshot and in the Q-method software. The post-sorting interviews, conducted online via Zoom (one-to-one) (see additional files 1-6: https://osf.io/h7tfp/files/osfstorage), covered two topics: 1. the reasoning behind the placement of cards, including the extremes of the sorting grid (scoring - 4, - 3, + 3, and + 4) and 2. innovation readiness factors that respondents thought were not included the statement set. The post-sorting interviews were conducted as an approach to access more in-depth information (56) and encourage the respondent to tell ‘the story’ in their own words (57, 58). The post-interviews (with the consent of each respondent), were recorded and transcribed.

4. Analyses and interpretation

The quantitative part of the analyses consisted of a by-person factor analysis using common techniques in Q-methodology (i.e., centroid extraction, varimax rotation (59)) and was performed to identify groups of respondents who had ranked the statements in a similar way. The assumption made is that if respondents have a similar opinion, they will rank the set of statements in a similar way. Consequently, these factors can be interpreted as shared perspectives on what is important for organizations in this sector to be innovation ready. The number of factors to retain for interpretation was selected on

the basis of factors having an Eigenvalue larger than one, a minimum of two respondents loading statistically significant ($p<.05$, the cut-off was 0.33 at $p<.05 = 1.96*(1 \div \sqrt{\text{No. of items in Q-set}}) = 1.96*(1 \div 6) = 0.33$), and a coherent interpretation (41). For each of the identified factors, an idealized ranking of the statements was calculated (factor arrays (41)), which represents how a respondent perfectly correlated with this perspective, would have ranked the statements (see Appendices 1-4). This involved calculating a weighted average ranking of the statements for respondents who are statistically significantly linked to this particular factor. The composite rankings of the statements of the four factors (Table 1) complemented with the qualitative data (consisting of the explanations of the respondents, statistically significantly associated with that perspective, given during the post-interview) were used to interpret and describe the factors as perspectives on factors enabling innovation readiness (60). The first interpretation of the perspectives was based on the characterizing, distinguishing and consensus statements for each perspective. Characterizing statements are those ranked by the respondents as most important (with a +4, or +3 score) or as least important (with a -4 or -3 score) in the composite ranking. Distinguishing statements are those that were ranked statistically significantly in a factor as compared to the other factors (denoted with a star* in Table 1). Consensus statements are those that are ranked similarly across factors (denoted with a plus+ in Table 1).

This first interpretation was then further refined using the explanations provided by respondents associated with the factor, and citations from these qualitative materials were added to the description of the perspectives for illustration purposes. The data were analyzed using KADE (61).

Quality assurance

The study received ethical approval from the Medical Ethics Board of Zuyderland Medical Center in the Netherlands with the number METCZ20220036. Permission to conduct the interviews for this study was granted by each respondent personally. Respondents were made aware of the study objectives, and written informed consent was obtained from respondents before the beginning of the interviews. A process logbook was kept by the first author to ensure that essential decisions were registered in a retrievable way from the start until the end of the research. This enabled the research team to monitor the progress and decision-making processes during the study. The logbook is stored on the UMserver, with access for the study team, and includes descriptions of important moments, decisions and solutions/actions undertaken.

The final data (on which the reported analyses are based) is stored on the UMserver and can be made available on request. In the Q-method software, the researcher does not have access to the respondent's Personal Identifiable Information (PID). The software does not record the IP addresses of respondents.

Results: interpretation of perspectives

In total, 30 stakeholders connected to long-term care participated in this study between April and June 2023 (Table 2). Respondents expressed that the set of 36 statements (Table 1) represented a complete overview of factors contributing to innovation readiness of long-term care organizations for older adults. The by-person factor analysis resulted in four factors, with 8, 5, 5 and 8 of the 30 respondents statistically significantly associated with them, respectively. Together the factors explained 46% of the variance in the ranking data (factor 1 to 4 respectively explained 22%, 9%, 9%, and 6% of the variance) and correlations between factors varied between 0.01 (factor 2 vs factor 3) and 0.47 (factor 1 vs factor 4). The first factor, which showed correlations between 0.19 and 0.47 with the other three factors will be presented first. Factors 1 vs factor 3 and factor 1 vs factor 4 were statistically significant respectively 0.36 and 0.47. Three respondents associated with more than one perspective and one respondent with a negative loading on factor 2 were not included in the computation of the composite sorts. After inspecting the composite sorts and the qualitative data from the interviews, the research team concluded that each one of the four factors represented an interesting and distinct perspective on innovation readiness. The composite rankings of the statements for these four perspectives are presented in Table 1 and shown in Appendices 1-4. The consensus statements did not highlight specific differences or similarities between the perspectives.

Below, we describe each perspective. Quotes from respondents are added in italics, followed by the number of the respondent. The first number in the brackets refers to the number of the statement from Table 1 and the second number refers to numerical ranking given to the statements in the sorting grid (Fig. 1) consisting of least important (- 4) to most important (+ 4).

Perspective 1: supportive role of management

Central in this perspective is the opinion that the top of the organization has to articulate the innovation strategy (#27,+4) (#1, +1*) and management has to simultaneously facilitate the climate to become innovation ready (#26, =+3*). *'Formulating a vision on innovation starts at the top, and management must create conditions for execution'* (respondent 10, staff member). In this perspective, (top)management roles are outlined by the respondents as 'defining the innovation course', 'creating the climate and conditions', and 'communicating about innovation.' *'(Top)management must point the organization's compass in the right direction'* (respondent 19, (top) management); *'People only participate if the board clearly communicates about the innovation purpose via annual meetings and intranet'* (respondent 24, staff member).

A significant aspect is that respondents of this perspective consider the active involvement of healthcare professionals and staff important in all steps of the innovation process (#16,+4) as they know whether or not an innovation will work; *'The board sets the innovation course involving employees in that process because they determine whether innovation can be promising or successful'* (respondent 5, consultant). Therefore,

respondents express that roles and tasks for employees engaged in innovation should be clear (#28, +2), but not fixed (#6, -2*).

The role of middle management is to create an attractive innovation climate by building trust, creating a safe environment, giving backup, communicating and prioritizing team activities (#26, +3*). *'Managers are needed to translate and communicate the innovation compass (determined by the board) into a roadmap for their team.'* Besides the importance of strategy and planning, respondents emphasized to make room for trial and error. Which requires management to have courage (#33,+3*). *'Also part of innovation is having the courage to experiment and allow yourself some failures'* (respondent 19, (top) management).

Respondents express that learning from and about innovation is important. Besides attention for a vision on learning how to innovate (#20, +1*) they express that middle management should be supported with knowledge for their role in innovating (#23,+3*). *'Support management to help them to overcome problems and have conversations with their team to find out: what do they run into?'* (respondent 19, (top) management). Management education should support them to facilitate an attractive innovation climate (#26,=3*).*'Managers need to encourage healthcare professionals to come up with innovative ideas. They need the knowledge to facilitate this process of innovation and learning'* (respondent 11, staff member). Providing a toolbox of innovation tools (#12,-3) and learning how to innovate (#21, -3) are not seen as a meaningful approach. *'First: get employees on board, the toolbox will come at a later stage'* (respondent 9, (top) management).

Of all the perspectives expressed, this one expresses a deliberate trade-off on the involvement of clients, family and relatives while innovating (#15, -4*) between relevance and doing it 'by default'. They mention that clients, family and relatives should only be involved when it is seen as relevant to their situation. *'Involving family depends on the type of innovation. Depending on the expected impact, you will either inform or involve them'* (respondent 5, consultant). Setting up physical spaces in the organization for innovation activities (#31, -4) is not seen as an added value by the respondents. They firmly believe that if organizations want to innovate, support needs to be organized close to the workplace. *'Physical spaces, you don't have to have them, as most innovations are integrated into current work processes'* (respondent 9, (top) management).

Table 1. Statements and ranking scores on the relative importance of factors contributing to innovation readiness (37)

Statement set		Perspectives			
		1. supportive role of manage-ment	**2. participation of the client (system) and employees**	**3. setting the course and creating conditions**	**4. structuring decision-making, roles and responsibilities**
1. Strategic Course for Innovation					
1	Formulate an innovation ambition	1*	-3*	4	4
2	Determine innovation theme(s)	0	0	2*	4*
3	Describe the organization's definition of innovation	-3	-4	1	-1
4	Allocate budget for innovation	2	1	3*	2
5	Create a multi-annual plan for innovation	-1	-4*	0	-2*
6	Make agreements about position and tasks of employees engaged in innovation	-2*	0*	-4*	3*
7	Set up innovation team(s) / unit(s)	0	-3	0	-2
8	Prepare technical infrastructure for innovation	0	-2	-3	1
9	Make innovation knowledge (gained in projects) available	-1	0	-2*	-4*
10	Make a communication plan for innovation	0	-1	1	-1
2. Innovation Journey					
11	Define the decision-making steps in the innovation process	-1	1	0	2*
12	Make a toolbox with innovation instruments available	-3	-3	-2	0*
13	Organize an innovation process (from idea to implementation)	-2	0	2	2
14	Have an overview and insight into the progress of innovations	1	-1	1	0
15	Involve clients, family and relatives while innovating	-4*	4*	1	1
16	Actively involve healthcare professionals in the innovation process	4	4	2	2
17	Exchange innovation knowledge with healthcare and knowledge institutions +	0	0	-2	-1
18	Monitor national innovation developments and trends	-2	-1	1*	-3
19	Collaborate with external partners on innovation themes	1	1	2*	-2*
20	Formulate a vision on learning from and about innovation	1*	-1*	3*	-2*

Table 1. continued

Statement set		Perspectives			
		1. supportive role of manage-ment	2. participation of the client (system) and employees	3. setting the course and creating conditions	4. structuring decision-making, roles and responsibilities
21	Organize education aimed at learning how to innovate	-3	2*	-2	-2
22	Compose innovation team(s) interdisciplinary	2	-2	2	-1*
23	Support middle management with knowledge for their role in innovating	3*	0	-4*	1
3. Leadership for Innovation					
24	Clear role for middle management in the field of innovating	2	-1*	-3*	3
25	Appreciate employees for their commitment to innovation	2	3	-1*	2
26	Middle management creates an attractive innovation climate for employees	3*	1	-1	0
27	Board communicates that innovation is an organization priority	4	-2*	4	3
28	Clear role for employees in the field of innovating	2	2	-2*	0
4. Learning for Innovation					
29	Reflect on innovation readiness of the organization +	-2	-2	-1	-1
30	Capture and evaluate learning experiences around innovation	-2	1*	-1	-3*
31	Set up physical spaces in the organization for innovation activities	-4	-2*	-3*	-4
32	Encourage employees to start with innovating themselves	-1	2*	0	0
5. Innovative Organizational Culture					
33	Have the courage to experiment	3	3	3	1*
34	Learn from failure and mistakes	0	2*	-1	-3*
35	Take time to learn	-1	3*	0	1
36	Learn from each other in the field of innovating +	1	2	0	0

*distinguishing statement ($p<.05$) for that perspective - are those statements that are found to be statistically significantly different from other statements within the other perspectives when it comes to how they are ranked by the respondents
+consensus statement - are those statements that do not distinguish between the various perspectives
Scores range between -4 and +4 correspond to the columns of the sorting grid (see Figure 1): -4 concerns ‘least important’; 4 concerns ‘most important’

Table 2. Characteristics of participating respondents

No.	Respondent group	Type of Organization	Size of organiza-tion ****	Main role of respondent
1	client representatives	Long-term care*	medium**	Client representative
2	innovation managers	Long-term care*	medium**	Project leader innovation
3	innovation managers	Innovation program long-term care	(n.a.)	Regional program manager innovation
4	client representatives	Long-term care*	medium**	Chair of the central client council
5	consultants	Consultancy		Consultant long-term care
6	academics	Expertise Centre long-term care		Senior advisor innovation
7	consultants	Independent		Innovation expert healthcare
8	(top)management	Innovation Fund for Long-term care	small***	CEO
9	(top)management	Long-term care*	medium**	Director HRM & Innovation
10	staff	Long-term care*	small**	Program manager processes & innovation
11	staff	Long-term care*	medium**	Program manager innovation & development
12	academics	University		Professor management & organization long-term care
13	client representatives	Client support organization		Director/coordinator
14	staff	Long-term care*	medium**	Policy advisor research & development & innovation
15	innovation managers	Hospitals, home care, long-term care*	large**	Manager innovation & information & automation
16	academics	University		Program Director Executive Master of Health
17	consultants	Independent		Consultant
18	academics	University of applied sciences		Lector in Long-term care
19	(top)management	Long-term care*	large**	CEO
20	(top)management	Long-term care*	medium**	CEO
21	consultants	Consultancy	medium**	Advisor
22	(top)management	Long-term care*	small**	Chairman of the Board of Directors
23	innovation managers	Long-term care*	large**	Program manager innovation and e-health
24	staff	Hospitals, home & long-term care*	large**	Head of Scientific Research
25	consultants	Independent		Consultant
26	staff	Long-term care*	medium**	Manager information management
27	academics	University of applied sciences		Professor
28	client representatives	Long-term care*	medium**	Chair of the central client council
29	innovation managers	Association for long-term care*		Senior advisor digitizing & innovation
30	client representatives	Long-term care*	small**	Coordinator client councils and network of volunteers

* Long-term care organization for older adults providing medical, transitional and nursing care, housing, personal care, assistance, and social services to older adults who cannot live independently.
** Annual reports 2022. *** Website of organization. ****Turnover small €0-100M, medium €100-200M, large €200M and more

Perspective 2: participation of the client (system) and employees

Central in this perspective is the opinion that active participation of both the client (system) and employees in the innovation activities of the organization (#15,+4*) (#16, +4) are most important. Respondents indicate that innovation should be aimed at the quality of care for the person who needs care, and therefore clients, family and loved ones have to be involved in innovation (#15,+4*). *'The essence is that organizations innovate to make it better for people receiving care, for people providing care, and for the network around it'* (respondent 4, client representative). Respondents most strongly agree (compared to perspectives 1, 3 and 4) that innovation should foremost be bottom-up based on the ideas and needs of the employees and less top-down (#1, -3*) (#27, -2*). Respondents strongly value, in line with perspective 1, the active involvement of healthcare professionals in the innovation process (#16, +4) as *'The willingness to innovate of healthcare professionals therein lies the essence of innovation readiness'* (respondent 1, client representative).

Similar to perspectives 1 and 3, respondents with perspective 2 believe that an organization has to appreciate employees for their commitment to innovation (#25, +3) as they are the ones who make it happen. *'The commitment and attitude of the organization are important and determine whether an innovation can be successful'* (respondent 21, consultant). Therefore, the organization should reward employees for their efforts and for the struggle that comes with innovation (#33, +3). *'If employees feel that they are allowed to innovate and experiment, they will want to keep doing it. If they are punished or reprimanded for not moving fast enough, a negative mode on innovating can arise'* (respondent 21, consultant).

Respondents are not in favor of setting up innovation teams (#7,-3), as innovation has to be done with all those who will use and work with it. *'It is best to involve everyone who wants and can and as much and as early as possible in innovations. Then you immediately know whether it works or not' (*respondent 21, consultant) In line with this, respondents holding this perspective strongly oppose managerial actions such as making an innovation definition (#3,-4) and creating a multi-annual plan for innovation (#5,-4*) as it does not help the employee in the workplace. *'Innovation is dynamic, which is opposite to a plan in which you commit to what you have planned out. You can commit to doing it, but not on the how and the when'* (respondent 13, client representative).

Respondents ranked statements related to stimulating and learning about innovation for employees as significantly more important than in perspectives 1,2, and 4 (#35,+3*) (#32,+2*) (#34,+2*) (#21,+2*). They consider taking time as an organization to learn how to innovate most important (#35, +3*) because innovating concerns behavior change and making new routines costs time. Therefore, they consider it essential to have realistic expectations and to not expect results from the innovation processes too quickly (#35, +3*). *'Healthcare professionals and staff should be given space to experiment, make mistakes, and take their time as innovating never happens overnight'* (respondent 21, consultant). Furthermore, respondents express that encouraging employees to start with innovation themselves (#32,+2*) and learning from mistakes (#34,+2*) adds to a

favorable innovation culture. *'At the organizational level, you can facilitate anything, but you also have to encourage people to feel free to just do it. That way they feel that they are in the lead to improve their work'* (respondent 30, client representative). Respondents indicate that education focused on learning to innovate (#21,+2*) should be determined by the individuals and teams based on what they need in their work and context and not predetermined by the organization (#20,-1*).

Perspective 3: setting the course and creating conditions

Perspective 3 focuses on organizational factors that are either supportive or conditional in becoming innovation ready. Respondents indicate the importance of preparing the organization's innovation direction (#1,+4) (#2,+2*) and organizing it to enable the envisioned direction. *'Formulating an innovation ambition ensures a clear perspective that can be shared in the organization'* (respondent 12, academic). Furthermore, aspects of organizing innovation deployment, to enable the strategic innovation course, are ranked in this perspective as significantly more important than in the other three perspectives. Respondents indicate that a vision of learning from and about innovation and a program to facilitate learning, reflecting on innovation (#20, +3*) is most valuable. *'That you know where you want to go as an organization and in what way'* (respondent 26, staff member). Likewise, respondents mentioned the importance of collaborating with external partners on innovation themes (#19,+2*) and monitoring national innovation developments and trends (#18,+1*). To enable these actions, respondents indicate innovation budget availability as conditional for innovation readiness (#4, +3*) *'without time, space and resources, little happens'* (respondent 12, academic). Similarly to respondents holding perspective 1, they consider that (top)management's role is paramount in indicating the organization's innovation ambition, priorities, and route towards it (#27, +4). *'The board of directors has to be intimately involved in innovating'* (respondent 22). In line with perspectives 2 and 3 the respondent's perspective of the role of the board and senior management is to encourage middle management to give space to and stimulate employees *'to have the courage to experiment'* (#33, +3) (respondent 8, (top)management).

Respondents suppose that employees, including middle management, in long-term care might not have innovating routinely high on their agenda and first have to be convinced to innovate before they are presented with knowledge for their role in innovating (#23,-4*). *'I believe in a clear vision and direction, then enthusiastic people are eager to join in'* (respondent 8, (top)management). Respondents indicate that the role and tasks of employees (including middle management) while innovating should not be set in stone (#6,-4*) (#24,-3*). *'Role clarity for employees will follow in time, enthusiasm is what you are looking for'* (respondent 22, (top)management). They favor encouraging employees to innovate relative to precise innovation instructions. *'Approach it a bit more organically, when it comes to employee participation'* (respondent 12, academic). Comparably to those holding perspectives 1, 2, and 4, they do not consider the presence of innovation spaces important (#31, -4*). *'People have to do it, availability of innovation spaces is not key'* (respondent 27, academic).

Perspective 4: structuring decision-making, roles and responsibilities

Central to this perspective is respondents' opinion that, to become innovation ready, an organization should formulate the innovation ambition (#1, +4) and themes (#2,+4*) and organize the innovation organization accordingly (#27,+3) (#24,+3) (#6,+3*) (#11,+2*). *'Formulating the ambition makes the intention of innovation concrete for employees: why do we want it?'* (respondent 18, academic). In line with perspective 2, the respondents of this perspective state that innovation must be linked to the strategy. *'Innovation itself is no aim but a means to providing valuable and affordable healthcare, linked to the overall strategy of the organization'* (respondent 7, consultant). Furthermore, they point out that the innovation themes (#2,+4*) help to make deliberate choices that fit the ambition and character of the organization. Respondents see decision-making in the innovation process as conditional at all stages (#11,+2*) and ranked this statement more important than in perspectives 1,2 and 3. *'You have to organize decision making otherwise you cannot take steps. That is why the innovation themes are so relevant. Participating in everything does not lead to success.'* (respondent 3, innovation manager). In line with perspectives 1 and 3, the respondents express that the board plays a pivotal role in communicating the strategic innovation course (# 27,+3). *'The board must give direction and facilitate towards middle management and employees and communicate about the innovation direction and invite employees to engage'* (respondent 28, client representative). Notable in this regard is the respondent's perspective that organizations should organize their own (innovation) course and not be dependent on innovation developments defined by others (statement 18, -3). *'You should certainly monitor (inter-national) innovation developments, but you have to start with your own ambition and focus on 'what does innovation X or Y* contribute' (respondent 23, innovation manager).

Respondents in perspective 4 rank organizing the roles and tasks for middle management and employees (#24,+3) (#6,+3*) highest compared to perspectives 1,2, and 3. Respondents mention the importance of a clear innovation role of middle management, as they are seen as *'the hub between care delivery and the board'* (#24,+3)'. *'Middle management is the turntable, they form the connection between the top and other parts of the organization'* (respondent 17, consultant). Being clear about expectations and making agreements about the position and tasks of employees (#6,+3*) is seen as vital by the respondents as they are the ones performing the day-to-day activities in the organization and therefore paramount in achieving innovation results. *'It is clear that healthcare professionals and staff must be given time and space to work on innovation otherwise they can not make the necessary innovation steps'* (respondent 17, consultant).

Respondents consider learning for innovation not as a one-off activity but as an important aspect that gradually takes place during the innovation process. Therefore, they rank statements such as 'make innovation knowledge (gained in projects) available' (#9,-4*) and 'capture and evaluate learning experiences around innovation' (#30,-3*) as less important. Furthermore, they prefer 'to learn from success' (instead of failure (#34,-3*) and 'to copy experiences from other organizations'.

Discussion

This study aimed to gain a deeper understanding of factors enabling innovation readiness in long-term care. Respondents agreed that the 36 statements (Table 1) represent a complete overview of factors contributing to innovation readiness of long-term care organizations for older adults. Respondents indicated that all 36 factors mattered at least to some extent for organizations to become better at innovating and that no important factors were missing from the set of statements. This also reaffirms the comprehensiveness of the framework outlining factors contributing to innovation readiness proposed in earlier studies on innovation readiness (37). These findings are in line with the literature about innovation readiness in business (62, 63) and healthcare (64, 65).

Using these materials, we identified four distinct perspectives among stakeholders, each highlighting specific innovation readiness factors that are considered 'most important' within the context of long-term care for adults in the Netherlands: 1. 'supportive role of management' 2. 'participation of the client (system) and employees' 3. 'setting the course and creating conditions' and 4. 'structuring decision-making, roles and responsibilities'. Perspectives 1, 3, and 4 are most aligned with the main factors 'strategic course for innovation' and 'leadership for innovation' of the innovation readiness framework (37) and indicate that these factors are considered central to innovation readiness. In line with this reasoning, respondents indicated that factors such as formulating an innovation ambition, providing an innovation budget, and decision-making should be seen as conditional.

In the post-sorting interviews, respondents added a developmental perspective to innovation readiness as they suggested there is a temporal order of the innovation readiness factors (66). Several respondents advised following the 'why', 'how', and 'what' questions as a sequence for the importance of innovation readiness factors (67, 68). The 'why' question, according to Sinek (68), is meant to align innovation goals with the purpose of the organization. Respondents indicated that an organization preferably starts with formulating its innovation ambition as it defines the intended reach of the innovation activities and guides decision-making concerning the choice of innovation projects. Payne et al. (69) explain the 'how' in innovation as the development of the skills, processes, and approaches to turn ambition into reality. The 'what' of innovation concerns innovation initiatives that are in line with the organization's ambition (62).

The variety in what is considered important according to the four perspectives implies that there may not be a fixed route toward innovation readiness. Although a shared understanding of factors enabling innovation readiness resulted from the study, we must recognize that there is a nuanced and varied landscape of opinions among respondents when it comes to their perspectives on how to become innovation ready. Therefore, the internal alignment of stakeholders on innovation readiness will likely determine the most suitable route for the organization to become better at innovating (50). This is in line with the volatile and multi-faced context of long-term care organizations (36) in which innovation is strongly influenced by and dependent

on government policies (39), organizational conditions such as size and age of the organization (70) and characteristics of the innovation organization (9, 71).

Three perspectives (1, 3, and 4) stated a top-down perspective by expressing the importance of formulating innovation ambition (#1) and the pivotal role of management (#27) herein. Perspective 2 stated a more bottom-up perspective on innovation readiness by expressing weight on the involvement of healthcare professionals and the client system (#15, #16). Herewith, the role of middle managers is expressed as vital by the respondents as they have a pivotal role in both bottom-up and top-down as also shown by Birken et al. (72) and Urquhart et al. (73). At the same time, respondents indicated that the organization has to be aware of the split roles of middle managers.

Conflicting situations might arise when managers might not be in favor of a proposed innovation, while at the same time, they are expected to shape the actions of individuals or teams in line with senior management plans. The same applies if the organizational culture acts as a potential constraint on the innovative efforts of managers (74, 75). Furthermore, middle management has traditionally been trained to take care of day-to-day business and is not necessarily competent and trained to navigate innovation (76, 77). Therefore middle management should be facilitated to fulfill their important role via sufficient resources and support (73, 78). The role of the board and senior management is to encourage middle management to give space to and stimulate employees to have the courage to experiment (78, 79).

The respondents' hierarchical position in the organization or professional role in long-term care did not seem to determine their perspective on factors enabling innovation readiness. Respondents from the six groups included in this study were associated with all four perspectives on innovation readiness, except for perspective 2 (participation of the client (system) and employees). Four of the five respondents associated with this perspective had a similar role in long-term care: representing clients to ensure that their viewpoints are heard and reflected in organization policies. Perspective 1 (supportive role of management) opposes perspective 2 in arguing that although it is desirable to give clients and their families a voice while innovating, they should only be involved when it is seen as relevant to their situation by management. Resident advisory councils seem to balance these perspectives (1 and 2) as only a few councils exercise their legal right to be consulted for organizational issues like innovating (80).

This study identifies and provides a valuable overview of innovation readiness factors that enhance the ability to innovate effectively for long-term care organizations for older adults. Organizations that prioritize these areas might be able to better navigate their innovation challenges. Future research could focus on the development of an assessment tool derived from the innovation readiness statements presented in this study. Such a tool would facilitate an assessment of the innovation maturity of long-term care organizations for older adults and identify opportunities for enhancing innovation readiness.

Strengths and limitations of this study

Several strengths and limitations of this study should be considered. First, our study was conducted in the long-term care sector in the Netherlands. The identified perspectives may, therefore, not represent the perspectives of respondents in other healthcare sectors and organizations in the Netherlands, or healthcare organizations outside of the Netherlands. Second, the four perspectives together explained 46% of the variance in the rankings of the statements by respondents. Although representing a frequently occurring percentage in Q-methodology studies (43), meaning that the perspectives capture significant shared perspectives on innovation readiness, there still may be more nuance to these perspectives in practice. However, more importantly, respondents indicated all factors of relevance to be included in the statement set and, hence, to be able to share their perspective adequately through the materials. Finally, the Q-methodology studies are intended to be an exploratory tool, providing insight into the heterogeneity of views on a specific topic (42). Nevertheless, there is no certainty whether the selection of respondents captures all relevant variation. The results of this study show four relevant perspectives but do not indicate how prevalent they are and among which stakeholders. Further research is needed in this regard. A strength of the study is that we collected rich quantitative and qualitative data that together allowed for an in-depth investigation into the variety of perspectives on innovation readiness in long-term care. The sample of respondents recruited for this study meets the choices of the number of participants of the Q-methodology (41, 81) and is similar to those of other studies (43). The use of online software to perform the ranking of the statements instead of manually sorting cards saved time and eliminated the need to manually enter the data (82, 83). The interviewer could follow in real-time the card sorting and comments made by the respondent. Although face-to-face interviews in the work setting of the respondent might have brought more in-depth information versus conducting online card-sorting and interviews. Furthermore, online card sorting and the accompanying post-interviews gave the possibility to have a sample with a wide geographical distribution and lower costs of administration. Finally, the materials developed can effortlessly be used to replicate this study in other healthcare sectors such as hospitals and welfare, although conducting a pilot study to check the comprehensiveness and clarity of the statement set in each contact is recommended.

Conclusions

The shared understanding of factors enabling innovation readiness reaffirmed the evidence-based framework of innovation readiness factors of long-term care organizations for older adults (37). The main factors ‘strategic course for innovation’ and ‘leadership for innovation’ are central to innovation readiness. Furthermore, the comprehensiveness of the list of factors contributing to innovation readiness (37) was endorsed. The heterogeneity in stakeholders’ perspectives shows a nuanced landscape of opinions toward becoming better at innovating. This study’s results indicate

that becoming innovation ready requires deliberate preparation upfront such as strategy, time, financial resources, and expertise that are not always readily available within a specific single innovation initiative. Research into innovation readiness of healthcare organizations is a rather new field. This research shows which innovation factors are important for innovation readiness, rather than how these factors can contribute to innovation readiness. The tendency to perceive innovation readiness as an evolving process (as mentioned by the respondents) could help to understand and explain how innovation readiness can be nurtured and grown over time. Furthermore, future research could be directed toward developing an assessment tool, based on this study's innovation readiness statements, assessing the maturity of long-term organizations for older adults and providing direction to opportunities for innovation readiness.

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Appendices

Appendix 1. Composite rankings of the statements for perspective 1: supportive role of management

-4	-3	-2	-1	0	1	2	3	4
** 15 Involve clients, family and relatives while innovating	12 Make a toolbox with innovation instruments available	13 Organize an innovation process (from idea to implementation)	11 Define the decision-making steps in the innovation process	34 Learn from failure and mistakes	** 20 Formulate a vision on learning from and about innovation	28 Clear role for employees in the field of innovating	** 26 Middle management creates an attractive innovation climate for employees	27 Board communicates that innovation is an organization priority
31 Set up physical spaces in the organization for innovation activities	21 Organize education aimed at learning how to innovate	29 Reflect on innovation readiness of the organization	5 Create a multi-annual plan for innovation	2 Determine innovation theme(s)	36 Learn from each other in the field of innovating	24 Clear role for middle management in the field of innovating	33 Have the courage to experiment	16 Actively involve health care professionals in the innovation process
	3 Describe the organization's definition of innovation	30 Capture and evaluate learning experiences around innovation	9 Make innovation knowledge (gained in projects)	8 Prepare technical infrastructure for innovation	** 1 Formulate an innovation ambition	25 Appreciate employees for their commitment to innovation	** 23 Support middle management with knowledge for their role in innovating	
		18 Monitor national innovation developments and trends	35 Take time to learn	10 Make a communication plan for innovation	14 Have an overview and insight into the progress of innovations	22 Compose innovation team(s) interdisciplinary		
		** 6 Make agreements about position and tasks of employees engaged in innovation	32 Encourage employees to start with innovating themselves	17 Exchange innovation knowledge with healthcare and knowledge institutions	19 Collaborate with external partners on innovation themes	4 Allocate budget for innovation		
				7 Set up innovation team(s) / unit(s)			*distinguishing statement (p<.05) **distinguishing statement (p<.01)	

Appendix 2. Composite rankings of the statements for perspective 2: participation of the client (system) and employees

-4	-3	-2	-1	0	1	2	3	4
3 Describe the organization's definition of innovation	12 Make a toolbox with innovation instruments available	22 Compose innovation team(s) inter-disciplinary	* 20 Formulate a vision on learning from and about innovation	2 Determine innovation theme(s)	26 Middle man-agement creates an attractive inno-vation climate for employees	** 32 Encourage employees to start with innovating themselves	** 35 Take time to learn	** 15 Involve clients, family and relatives while innovating
** 5 Create a multi-annual plan for innovation	** 1 Formulate an innovation ambition	* 31 Set up physical spaces in the organization for innovation activities	18 Monitor national innovation developments and trends	** 6 Make agreements about position and tasks of employees engaged in innovation	** 30 Capture and evaluate learning experiences around innovation	** 34 Learn from failure and mistakes	33 Have the courage to experiment	16 Actively involve health care professionals in the innovation process
	7 Set up innovation team(s) / unit(s)	29 Reflect on innovation readiness of the organization	** 24 Clear role for middle management in the field of innovating	23 Support middle man-agement with knowledge for their role in innovating	11 Define the decision-making steps in the innovation process	28 Clear role for employees in the field of innovating	25 Appreciate employees for their commitment to innovation	
		8 Prepare technical infrastructure for innovation	10 Make a communication plan for innovation	9 Make innovation knowledge (gained in projects)	4 Allocate budget for innovation	** 21 Organize education aimed at learning how to innovate		
		** 27 Board communicates that innovation is an organiza-tion priority	14 Have an overview and insight into the progress of innovations	13 Organize an innovation process (from idea to imple-mentation)	19 Collaborate with external partners on innovation themes	36 Learn from each other in the field of innovating		
				17 Exchange innovation knowledge with healthcare and knowledge institutions			*distinguishing statement (p<.05) **distinguishing statement (p<.01)	

Appendix 3. Composite rankings of the statements for perspective 3: setting the course and creating conditions

-4	-3	-2	-1	0	1	2	3	4
** 23 Support middle management with knowledge for their role in innovating	8 Prepare technical infrastructure for innovation	17 Exchange innovation knowledge with healthcare and knowledge institutions	34 Learn from failure and mistakes	32 Encourage employees to start with innovating themselves	15 Involve clients, family and relatives while innovating	* 2 Determine innovation theme(s)	* 4 Allocate budget for innovation	1 Formulate an innovation ambition
** 6 Make agree-ments about position and tasks of employ-ees engaged in innovation	** 24 Clear role for middle management in the field of innovating	* 9 Make innovation knowledge (gained in projects)	30 Capture and evaluate learning experiences around innovation	7 Set up innovation team(s) / unit(s)	10 Make a communication plan for innovation	22 Compose innovation team(s) interdisciplinary	33 Have the courage to experiment	27 Board communicates that innovation is an organization priority
	* 31 Set up phys-ical spaces in the organiza-tion for innova-tion activities	12 Make a toolbox with innovation instruments available	29 Reflect on innovation readiness of the organization	36 Learn from each other in the field of innovating	3 Describe the organization's definition of innovation	* 19 Collaborate with external partners on innovation themes	** 20 Formulate a vision on learning from and about innovation	
		** 28 Clear role for employees in the field of innovating	** 25 Appreciate employees for their commitment to innovation	35 Take time to learn	18 Monitor national innovation developments and trends	16 Actively involve health care professionals in the innovation process		
		21 Organize education aimed at learning how to innovate	26 Middle management creates an attractive innovation climate for employees	11 Define the decision-making steps in the innovation process	14 Have an overview and insight into the progress of innovations	13 Organize an innovation pro-cess (from idea to implementa-tion)		
				5 Create a multi-annual plan for innovation			*distinguishing statement (p<.05) **distinguishing statement (p<.01)	

Appendix 4. Composite rankings of the statements for perspective 4: structuring decision-making, roles, and responsibilities

-4	-3	-2	-1	0	1	2	3	4
** 9 Make innovation knowledge (gained in projects)	18 Monitor national innovation developments and trends	* 20 Formulate a vision on learning from and about innovation	22 Compose innovation team(s) interdisciplinary	28 Clear role for employees in the field of innovating	* 33 Have the courage to experiment	16 Actively involve health care professionals in the innovation process	27 Board communicates that innovation is an organization priority	* 2 Determine innovation theme(s)
31 Set up physical spaces in the organization for innovation activities	** 34 Learn from failure and mistakes	21 Organize education aimed at learning how to innovate	17 Exchange innovation knowledge with healthcare and knowledge institutions	36 Learn from each other in the field of innovating	35 Take time to learn	4 Allocate budget for innovation	24 Clear role for middle management in the field of innovating	1 Formulate an innovation ambition
	** 30 Capture and evaluate learning experiences around innovation	* 7 Set up innovation team(s) / unit(s)	3 Describe the organization's definition of innovation	32 Encourage employees to start with innovating themselves	8 Prepare technical infrastructure for innovation	11 Define the decision-making steps in the innovation process	** 6 Make agreements about position and tasks of employees engaged in innovation	
		** 5 Create a multi-annual plan for innovation	29 Reflect on innovation readiness of the organization	14 Have an overview and insight into the progress of innovations	23 Support middle management with knowledge for their role in innovating	13 Organize an innovation process (from idea to implementation)		
		** 19 Collaborate with external partners on innovation themes	10 Make a communication plan for innovation	26 Middle management creates an attractive innovation climate for employees	15 Involve clients, family and relatives while innovating	25 Appreciate employees for their commitment to innovation		
				** 12 Make a toolbox with innovation instruments available			*distinguishing statement (p<.05) **distinguishing statement (p<.01)	

4

CHAPTER 5

Feasibility of the Maastricht Innovation Readiness Approach (MIRA): a self-assessment of innovation readiness in long-term care organizations for older adults

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Abstract

Background

Innovation in long-term care for older adults is essential to manage challenges such as a growing demand and workforce shortages. Organizations with higher innovation readiness are more likely to adopt and sustain innovations effectively. An approach indicating the innovation readiness of long-term care organizations for older adults is lacking. To address this, the Maastricht Innovation Readiness Approach (MIRA) was developed to (1) increase understanding about innovation readiness, (2) facilitate the organization's self-assessment of innovation readiness, and (3) inspire the organizational conversation about how to become better at innovating.

Objective

To examine the feasibility of MIRA and to explore whether MIRA could be successfully applied in long-term care practice.

Methods

MIRA consists of a questionnaire and a consensus meeting. To evaluate the MIRA approach, a mixed-method cross-sectional feasibility study was conducted in 10 Dutch long-term care organizations. The study evaluated scores on the MIRA Questionnaire, intra-rater reliability of the MIRA Questionnaire, and feasibility of the MIRA Questionnaire and Consensus meeting.

Professionals (involved in innovation) were asked to (1) fill in the Questionnaire and additional closed questions about its feasibility twice online (1-month interval) (2) participate in the Consensus meeting and answer verbally open questions during the Consensus meeting and (3) complete a questionnaire directly following the consensus meeting on its feasibility.

Results

In total, 173 participants completed the MIRA Questionnaire at t1 (#128 at t2); 127 participants attended the MIRA Consensus meeting (t1). The mean perceived innovation readiness score was 6.6 (scale 1-10). Intra-rater reliability of the MIRA Questionnaire was good (ICC > 0.75). Participants evaluated MIRA as acceptable, suitable, and of added value: 88% indicated that MIRA provides insight into their organization's innovation readiness, and 84% would recommend MIRA to other organizations. Interestingly, participants suggested annual use of MIRA.

Conclusion

MIRA is a feasible approach to assess innovation readiness in long-term care. It enhances internal awareness, supports group reflection across roles and disciplines, and may support structured progress in innovation readiness. However, it remains

unclear whether conducting MIRA improves innovation readiness. Longitudinal studies are needed to follow organizations implementing steps to improve innovation readiness and to explore how these contribute to successful innovation outcomes.

Introduction

Innovation in long-term care for older adults is crucial for addressing challenges such as growing demand, workforce shortages, and shrinking resources (1). Greenhalgh et al. (2) see innovation as "a novel set of behaviors, routines, and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost-effectiveness, or user experience, and that are implemented by planned and coordinated actions." Organizations that are more innovation ready are found to adopt innovations more swiftly and sustain them more durably (3-5). 'Innovation readiness' indicates an organization's maturity level to succeed in any type of innovation. Maturity is the extent to which an organization has organized and prepared key factors to facilitate innovation readiness (6).

Long-term care organizations are insufficiently aware of the competencies and preconditions needed to prepare the organization for successful innovation (6-8). To become better at innovating, organizations must actively work on innovation readiness. Understanding the organization's current state is the first step toward improving it (9-11). Insights into factors contributing to becoming better at innovating and assessment of the innovation readiness maturity level help organizations to understand where their "opportunities for improving innovation readiness" lie (12-14).

Various assessments and instruments have been developed to assess readiness to implement a specific innovation (15-17). Instruments assessing innovation readiness were either not scientifically developed, evaluated, or tested in healthcare (18-21). An approach indicating the innovation readiness of long-term care organizations for older adults is lacking (22-24). To address this, we developed the Maastricht Innovation Readiness Approach (MIRA) in collaboration with an advisory group of managers and healthcare professionals involved in innovating within long-term care organizations (25). The purpose of MIRA is to (1) increase understanding about innovation readiness, (2) facilitate the organization's self-assessment of innovation readiness, and (3) inspire the organizational conversation about how to become better at innovating. First, the MIRA Framework (Appendix 1) was constructed based on the results of a scoping review into scientific studies on the innovation readiness of healthcare organizations (6), supplemented by qualitative research (26-28) and confirmed by a Q-study (29) in long-term care. Second, based on the MIRA Framework, we iteratively created and refined the MIRA Questionnaire, and content validity and pilot testing were conducted (Table 1) (30-32). Finally, a structured MIRA Consensus meeting (Appendix 3: Table 1) was designed to collectively interpret the MIRA Questionnaire results.

We sought to examine whether MIRA could be successfully applied in long-term care practice. This study aims to examine the perceptions of long-term care professionals regarding the feasibility of MIRA in Dutch long-term care organizations and to explore whether MIRA has the potential to support innovation readiness in this context. The research was guided by the following research questions: 1. How do participants score the MIRA Questionnaire and rate their organization's innovation readiness? 2. What is the intra-rater reliability of the MIRA Questionnaire? 3. How do participants evaluate the feasibility of the MIRA Questionnaire and Consensus meeting?

Materials and Methods

Study design

A mixed-method cross-sectional study was conducted in long-term care organizations in the Netherlands from July 2024 to December 2024.

Participants and setting

MIRA is developed for long-term care organizations for older adults in the Netherlands (e.g., care homes, nursing homes, assisted living facilities, and residential aged care). They provide a range of services, including medical, transitional, and nursing care, housing, personal care, assistance, and social services to older adults who are unable to live independently (30). Dutch long-term care is largely funded through mandatory public health insurance and is increasingly investing in innovating, e.g., digital technologies, new care models, and organizational redesign (31). While some larger organizations have dedicated innovation managers or teams, many long-term care organizations rely on project-based structures or multidisciplinary working groups to develop and implement innovations.

We intended to test the MIRA Questionnaire and the MIRA Consensus meeting in 10 long-term care organizations, which were approached and selected through purposive sampling based on their capacity and interest in implementing MIRA. Five were recruited through employers' organizations for care and welfare, two through the Living Lab in Ageing and Long-Term Care, and three through the research team's network (32). Participating organizations were informed about the study's objectives and mode of participation. They made their own decisions about which participants to include for the MIRA Questionnaire and the MIRA Consensus meeting. We instructed the internal coordinator (who was appointed by the participating organization) to include healthcare professionals who were involved in innovation and had sufficient insight to reflect on their organization's innovation readiness, ideally representing a range of roles, disciplines, and organizational levels. To be able to participate, organizations were required to invite a minimum of 10 participants to complete the MIRA Questionnaire and a minimum of 8 participants to attend the MIRA Consensus meeting. Each organization was asked to obtain the Board of Directors' consent on participation in this study.

Table 1 MIRA Questionnaire
Questions (#31) in 4 innovation readiness domains: (1) strategic direction, (2) organization of innovation, (3) leadership for innovation, and (4) learning climate

Strategic direction for innovation (M)
In my organization, innovation is guided by our ambition. Innovation ambition includes what kind of innovation the organization pursues and why (improving, renewing, and/or radical innovation) and the associated ambition (e.g., being a follower or leader).
My organization ensures that innovation themes provide direction for innovation. Innovation themes: areas in which you want to achieve added value through innovation, for example, sustainable employability of staff or enhancing autonomy for clients.
In my organization, we use an annual plan for innovation. An innovation plan with a budget, actions, and strategies to execute the innovation ambition step by step.
In my organization, the innovation budget is adjusted where necessary. Innovation budget: funds allocated for innovation, including the purchase of innovations and time for employees dedicated to innovation projects.
My organization has defined specific tasks, roles, and positions for innovation. The organization describes innovation tasks and responsibilities per position and/or team.
My organization ensures that the technical infrastructure supports innovation. Technical prerequisites are in place to support all types of innovations (social, process, technological).
My organization communicates about innovation to employees. Planned communication about, for example, innovation ambition, projects, experiences, and results.
Organization of innovation (M)
My organization visibly pays attention to the organization of innovation. Innovation is visibly organized by, for example, establishing innovation roles, teams, and committees specifically focused on this.
My organization ensures there is an overview and insight into the progress of innovation. Having an overview of innovation projects to guide decision-making, for example through progress reports.
My organization uses a specific approach to shape the innovation process. This approach involves the steps in an innovation process, such as how to start an innovation project, how long it will take, and how to implement it .
My organization uses a toolbox with innovation methods. A collection of innovation techniques and tools, such as a template for an implementation plan or brainstorming approaches.
My organization ensures that decision-making supports innovation. There is clarity within the organization about who decides what and when in the innovation process, including prioritizing innovation themes, project selection, evaluation, progress, and budget.
My organization involves clients, family members, and close contacts in innovation. Clients and their relatives provide information or advice or contribute ideas for innovations.
My organization provides opportunities to employees to be involved in innovation. The organization gives all employees the opportunity to participate in innovation, both solicited and unsolicited. For example, by working on their own ideas.
My organization exchanges knowledge and experience on innovation with healthcare and knowledge institutions. Sharing knowledge and experience, such as experiences with implementation and lessons learned.
My organization keeps track of regional and national developments in the field of innovation. Monitoring developments in society, government, health insurance offices, suppliers, and participating in events that offer opportunities for innovation in your organization.

Table 1. continued

My organization collaborates with companies in the field of innovation. Collaborating with, for example, ICT companies and suppliers of innovations by amongst others providing feedback on new products and conducting experiments, pilots, and implementations.
My organization shapes learning from/about innovation based on a vision. A vision that indicates how the organization learns from/about innovation and how the organization creates a work environment that promotes learning about innovation.
Leadership for innovation (M)
In my organization, the board expresses that innovation is a priority. The board lets employees know and feel that innovation is important, for example, continuing to support innovation initiatives even even when things 'go wrong'
My organization clearly expresses to managers what is expected of them in terms of innovation. For managers, expectations in the area of innovation are clear, such as encouraging employees, presenting their own innovation plans, and creating a supportive environment.
My organization invites employees to participate in innovation. Employees are encouraged and know what is expected regarding innovation. For example, bringing up own ideas, pointing out bottlenecks, voicing doubts, and daring to try something new.
In my organization, managers actively involve employees in the innovation process. Managers give employees space to engage in innovation, for example, by translating innovation policies into opportunities for the team and translation the team's wishes to the organization.
Learning climate (M)
My organization ensures that innovation knowledge is available and accessible for everyone. The approach to innovations, experiences, and results from innovation projects are shared within the organization. For example, knowledge of what went well and what didn't .
My organization ensures alignment between strategy, organization, leadership, and learning environment to improve in the field of innovation. To get better at innovating, alignment between the organization and the execution of innovation is important. For example, by detailing the innovation ambition into innovation themes to support decision-making.
My organization stimulates knowledge exchange between employees in the field of innovation. Facilitating moments and meetings to exchange experiences related to innovation.
My organization evaluates progress in getting better at innovating. Together, it is discussed whether the steps that have been taken to improve have been successful and why.
My organization uses research to support and evaluate innovations. Research conducted by the organization or by others is used to develop innovations and to evaluate whether the intended effect has been achieved.
In my organization, we have a training plan for innovation. A plan and schedule for training in the field of innovating. For example, which courses and trainings and for whom.
My organization offers opportunities for employees to receive training in the field of innovation. Support and training for employees, for example, in implementing innovation in their own work environment or shaping a brainstorming session.
In my organization, managers are trained to stimulate innovation within their teams. Training for managers to facilitate innovation within their teams. For example: how do you identify a need for innovation.
My organization provides rooms for innovation activities. Specific rooms or locations are set up for innovation activities, such as trainings, brainstorming sessions, and team meetings.

Data collection and analysis

MIRA

Data were collected and analysed for the MIRA Questionnaire and the MIRA Consensus meeting. The MIRA Questionnaire contains 31 questions in four domains: 1. strategic direction, 2. organization of innovation, 3. leadership for innovation, and 4. learning climate. Participants assessed factors that contribute to the organization's innovation readiness. Each question has the same 6 scoring options (ordinal) (Table 2) - 'not', 'informal', 'occasionally', 'consistently', 'optimally', 'no insight' - and is informed by innovation maturity scales used in business (21, 33). These maturity positions (Table 2) outline an organization's path to achieving innovation readiness. They consist of three interconnected elements: frequency, agreements, and learning: (1) the extent to which organizations have organized the innovation readiness factors (2) whether agreements have been made (for example, in internal sessions or policies of the organization), and (3) the extent to which organizations reflect on and learn from initiatives to improve innovation readiness. The frequency of agreement executions indicates the extent to which innovation-related actions are consistently implemented within an organization's day-to-day operations. (34). The aspect of embedding innovation through agreements helps sustain strategic focus and integrates innovation into the organization's long-term learning (34). The component of learning helps to turn individual insights into collective capabilities and embed innovation into daily practices (34, 35).

The MIRA Questionnaire was distributed to participants via the online survey platform Qualtrics, following an email invitation from the internal coordinator. Participants completed the questionnaire on either a desktop or mobile device and received a summary of their responses by email upon completion. Automatic reminders were sent after 7 days to those participants who had not yet completed the questionnaire. Participants were individually asked for consent and informed how the data would be used. The responses of the participants were securely stored (compliant with the General Data Protection Regulation (36)) and shared, summed up, and namelessly at the organizational level with the participating organization.

Table 2 Innovation readiness maturity positions: response options

NO INSIGHT	NOT	INFORMAL	OCCASIONALLY	CONSISTENTLY	OPTIMALLY
I have insufficient insight into this	We don't do this	We do this	We do this occasionally	We do this consistently	We do this optimally
I can't give an opinion on this	We have no agreements about it	We have no agreements about it	According to agreements made	According to agreements made	According to agreements made We learn from it

The MIRA Consensus meeting (37) followed a predefined set-up and interview guide (supplementary Table 1) and was moderated by researcher MWH. During the meeting, background information on innovation readiness was given, and the MIRA Questionnaire results were presented. Participants were encouraged by MWH to actively reflect on the results (recognizability of the results, similarities and differences in the innovation readiness scores) and to explore opportunities towards innovation readiness. The meeting lasted 2 hours and was held within 2 months after completing the MIRA Questionnaire at the location of the long-term care organization.

Scores on innovation readiness

Participants' scores on innovation readiness were collected via the MIRA Questionnaire (Table 1). The innovation readiness score for the organization overall, per domain and question separately are calculated by summing up scores of all participants, for all 31 questions, per domain and question respectively, without weights (each score is given equal weight) (38) and presented in percentages (of the innovation readiness maturity scoring options). MIRA Questionnaires with lacking data were excluded from the analysis. One extra question was added to the MIRA Questionnaire (at t1), asking the participants to rate their organization's innovation readiness on a scale from 1 to 10 (to complement the overall picture of the participating organizations). The numeric ratings on the perceived innovation readiness score were summed up and divided by the number of participants to calculate the mean for each organization.

Intra-rater reliability data

To evaluate inter-rater reliability, participants received the MIRA Questionnaire at both t1 and t2. A good score on intra-rater reliability means that the questionnaire has low variability in interpretation, indicating that questions and scoring options are clear and well understood. For the intra-rater reliability (to evaluate the 'participant reporting' of the questionnaire), the Intra-class Correlation Coefficient (ICC) was used. Estimates above 0.75 were considered as good, between 0.50 and 0.75 as moderate, and below 0.50 as poor reliability scores, respectively (39).

Feasibility dimensions

To evaluate the feasibility of the MIRA Questionnaire and the MIRA Consensus meeting, Gadke et al. and Orsmond et al. (38, 39) feasibility dimensions – acceptability, suitability, and added value - were used (Table 3, including the related research questions and operationalization (40)). Acceptability refers to how participants perceive and respond to MIRA, including whether it is agreeable, satisfactory, or easy to use (38, 39, 41). Suitability refers to the perceived fit or relevance of MIRA for a particular setting (39, 42, 43). Added value indicates the perceived usefulness, meaning the extent to which participants find MIRA contributes to innovation readiness (39, 42). Data for evaluating the dimensions of 'acceptability' and 'suitability' of the MIRA Questionnaire were collected at t1 by means of six additional questions (three closed and three

open-ended). For analyzing the latter, thematic content analysis was employed. To evaluate the 'added value' of MIRA (Questionnaire & Consensus meeting) and the 'acceptability and suitability' of the MIRA Consensus meeting, participants answered closed-questions on paper at the end of the consensus meeting. Besides that, MWH invited participants during the consensus meeting to collectively reflect on and share their opinions on MIRA's 'added value'. Researchers KD, LJ, EV, MD and MWH observed the meeting and documented participant reflections. To analyze the group reflection on MIRA's 'added value', researcher MWH read these notes and summarized the main findings. The closed questions (5-point Likert scale) were analyzed in SPSS. Mean scores (for the Likert-scale) between 1.0 and 2.4 were considered inadequate, between 2.5 and 3.4 needs attention, between 3.5 and 3.9 acceptable, between 4.0 and 4.4 good, and 4.5 and 5.0 very good (40). MIRA Questionnaires with lacking data were excluded from the analysis.

Ethical considerations

The study received ethical approval from the Medical Ethics Board of Zuyderland Medical Center in the Netherlands with the number METCZ20220036. The data collection and data storage plan were approved by the local General Data Protection Regulation committee of the University of Maastricht. Participation in the study was anonymous and voluntary. Participants were informed about this both in the invitation e-mail and at the beginning of the MIRA Questionnaire (page 1). By proceeding to the second page with the substantive questions, participants gave consent.

Results

The MIRA Questionnaire and the MIRA Consensus meeting were tested in 10 long-term care organizations that varied in size and were geographically spread in the Netherlands. Participants from different organizational levels were invited by the participating organizations: board members, care directors, innovation managers, staff responsible for finance, policy, ICT, communication, facilities and quality with a rol in innovation, client representatives, team managers, nursing home managers, medical and well-being staff, human resources managers and staff involved in learning, direct care professionals, both in residential long-term care and community-based care, such as registered nurse's baccalaureate-educated and vocationally trained, and certified nurse assistants having a role in innovation. The MIRA Questionnaire (Table 1) (including the question about the numeric rating (1-10) on the organization's innovation readiness at t1) was completed by 173 participants at t1, 128 participants at t2, and 127 participants attended the MIRA Consensus meeting. Due to administrative reasons, only 103 participants completed the open questions on the acceptability and suitability of the MIRA Questionnaire at t1.

Table 3 Feasibility dimensions

Feasibility dimensions	Research Question	Operationalization
Acceptability and suitability		
MIRA Questionnaire		
1a. show that the MIRA Questionnaire is appropriate for use by participants	How do participants evaluate the acceptability and suitability of the questionnaire?	The questions were clear[1,3] The response options were clear[1,3] The instructions on the first page were sufficient to complete the questionnaire[1,3] How did you experience answering these questions?[2] Did answering these questions benefit you personally?[2] Do you have any questions or comments about the questions asked?[2] *(questions were part of the online MIRA Questionnaire at t1)*
MIRA Consensus meeting		
1b. show that the MIRA Consensus meeting is appropriate for use and appealing to participants	How do participants evaluate the acceptability and suitability of the consensus meeting?	The composition of the group of participants in the consensus meeting was appropriate[1] The feedback of the results of the MIRA questionnaire was understandable[1] I liked the set-up of the consensus meeting[1] *(questions were answered on paper in the MIRA Consensus meeting)*
Added value		
MIRA Questionnaire & Consensus meeting		
2. show that the participants experience the use of MIRA as relevant	How do participants evaluate the added value of MIRA (questionnaire and consensus meeting)	Due to the consensus meeting, we know better where we stand in terms of innovation readiness[1] I now have more insight into factors that are important for innovation readiness[1] I would recommend this approach (questionnaire plus consensus meeting) to other organizations[1] Our organization could have conducted the questionnaire and led the consensus meeting (without external support)[1] *(questions were answered on paper in the MIRA Consensus meeting)*
		How did you experience MIRA (questionnaire and consensus meeting)?[2] *(question asked by researcher MWH at the end of the consensus meeting)*

[1] 5-point Likert scale: fully disagree, disagree, neither agree nor disagree, agree, fully agree
[2] open-ended question
[3] data available for 6 out of 10 organizations (due to administrative reasons)

Scores on innovation readiness

Table 4 presents participants' scores on innovation readiness (the numeric rating (1-10)) of the organization's innovation readiness and the overall summed-up innovation readiness scores per participating organization (on the 31 questions of the MIRA Questionnaire). The MIRA overall innovation readiness results showed scores from 2% to 37% ('not' and 'consistently' respectively). All organizations scored highest on 'consistently' (mean 31%). Organizations rated their innovation readiness from 5.7 to 7.4 (mean 6.6).

Table 4 Participants MIRA Questionnaire scores - #10 LTC organizations

	Size of LTC* organization***		Numeric rating of innovation readiness ****	OVERALL INNOVATION READINESS SCORE (#31 MIRA QUESTIONS SUMMED UP)					
				No Insight *I have insufficient insight into this I can't give an opinion on this*	**Not** *We don't do this We have no agreements about it*	**Informal** *We do this We have no agreements about it*	**Occasionally** *We do this occasionally According to agreements made*	**Consistently** *We do this consistently According to agreements made*	**Optimally** *We do this optimally According to agreements made We learn from it*
No.	Turnover in euro's	SD	(mean)	(%)	(%)	(%)	(%)	(%)	(%)
1	large**	0.9	6.4	14	8	10	26	34	8
2	medium**	0.8	7.2	8	12	14	20	37	9
3	small**	1.7	6.0	9	11	21	22	24	13
4	medium**	1.4	5.7	11	16	21	24	24	4
5	large**	1.4	6.6	22	10	10	21	29	8
6	medium**	1.3	7.3	15	6	12	24	30	13
7	medium**	0.6	6.6	15	2	9	21	35	18
8	medium**	1.0	6.3	6	8	15	28	37	6
9	medium**	1.1	7.4	9	9	9	27	34	12
10	medium**	1.1	6.6	6	5	12	27	29	21
mean		1.1	6.6	12	9	13	24	31	11
range		1.1 (0.6-1.7)	1.7 (5.7-7.4)	16 (6-22)	11 (5-16)	12 (9-21)	8 (20-28)	8 (29-37)	14 (4-18)

* Long-term care organization for older adults providing medical, transitional, and nursing care, housing, personal care, assistance, and social services to older adults who cannot live independently
** Annual reports 2024
*** Turnover in euro's: small €0-100M, medium €100-200M, large €200M and more
**** Numeric rating - All things considered, what rating would you give your organization in terms of innovation readiness (1-10)?

Intra-rater reliability data

128 Participants completed the MIRA Questionnaire at t1 and t2, about a month apart. The overall 1-month intra-rater reliability was good (ICC above 0.75)(Table 5). The ICC values for the intra-rater reliability per question (presented with a 95% confidence interval in the additional file and at https://osf.io/x73p6/files/hqv4n) are “moderate” to “good”. Estimates above 0.75 were considered as good, between 0.50 and 0.75 as moderate, and below 0.50 as poor reliability scores, respectively. Participants gave the same answer at t1 and t2 for 38% to 63% of the questions. For 9 specific questions (questions 7, 11, 12, 14, 15, 16, 22, 25, and 30), at least half of the participants gave the same answer both times. Questions that were answered the same or one score up (for example, someone choosing ‘occasionally’ at t1 and ‘consistently’ at t2) or below varied between 73% (Table 1: question 4) and 88% (Table 1: question 8).

Table 5 Intra-rater reliability MIRA Questionnaire
(https://osf.io/x73p6/files/hqv4n : ICC for all 31 MIRA questions (see also Appendix 2)

Response Option	t1 (%)	t2 (%)	Difference (%)	ICC (intra-class correlation) value	95% confidence interval	
					Lower bound	Lower bound
Not	9.2	8.5	-0.7			
Informal	14.8	14.9	0.1			
Occasionally	23.4	23.2	-0.2	Single 0.992 Average 0.996	Single 0.947 Average 0.996	Single 0.999 Average 0.999
Consistently	30.1	32.2	2.1			
Optimally	12.3	11.5	-0.8			
No insight	10.3	9.8	-0.5			

Feasibility dimensions

Acceptability and suitability of the MIRA Questionnaire

Participants rated the questions and the response options overall as clear (>72% agree and fully agree). The instructions in the cover letter were regarded as sufficient to complete the Questionnaire (92% agree and fully agree) (Table 6). Thematic content analysis on the three open-ended questions was used for evaluating ‘acceptability’ and ‘suitability’ (https://osf.io/x73p6/files/kywxb). It showed that participants rated the Questionnaire positively for its language use (suitable), routing and navigation (logical), instructions (clear), response options (intuitive), and the design of the online presentation (including the colorful design of the 6 scoring options). Some participants mentioned that their choice for the option 'no insight' was frequently a result of lacking enough information or an overview to answer specific questions due to their role or position in the organization. Furthermore, in the open-ended questions, participants provided suggestions for improvement on the cover letter (it is recommended to emphasize in

instructions that the focus for answering the innovation readiness questions should be the entire organization (and not a specific department), on the term innovation (which needs further clarification), and on the design (such as adding an option at each question to write a rationale or explanation). Furthermore, participants found the term 'agreements' in the scoring options to be vague. They suggested clarifying what qualifies as an agreement, whether it refers to informal discussions or documented policies. For question 28, participants suggested clarifying whether 'the training plan' refers generally to education about innovation or to the existence of a specific training plan within an innovation project. For question 31, they proposed to add 'the possibility to organize room for innovation activities'.

On average, the self-assessment took 10 to 15 minutes to complete, which was considered acceptable. Participants felt that the time investment was manageable within their daily workflow. The MIRA Questionnaire was perceived by the participants as relevant to their work, as it helped them reflect on their role in this process, increased their understanding of innovation readiness, and provided insight into their organization's innovation maturity. Furthermore, the questions and structured scoring options provided awareness of the next steps the organization needs to take toward innovation readiness.

Table 6 Acceptability and suitability of the MIRA Questionnaire

<table>
<tr><th>Closed questions (MIRA Questionnaire at t1)</th><th>Mean (5-point Likert scale)</th><th>Median</th><th>SD</th><th>% agree / fully agree</th></tr>
<tr><td>The questions were clear*</td><td>3.7</td><td>4.0</td><td>0.65</td><td>73</td></tr>
<tr><td>The response options were clear*</td><td>3.7</td><td>4.0</td><td>0.74</td><td>72</td></tr>
<tr><td>The instructions on the first page were sufficient to complete the questionnaire*</td><td>4.2</td><td>4.0</td><td>0.56</td><td>92</td></tr>
<tr><td>Open-ended questions (MIRA Questionnaire at t1)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>How did you experience answering these questions?</td><td rowspan="3">data available (41) https://osf.io/x73p6/</td><td></td><td></td><td>n.a.</td></tr>
<tr><td>Did answering these questions benefit you personally?</td><td></td><td></td><td>n.a.</td></tr>
<tr><td>Do you have any questions or comments about the questions asked?</td><td></td><td></td><td>n.a.</td></tr>
</table>

*data from 6 out of 10 organizations

Acceptability and suitability of the MIRA Consensus meeting

Participants rated the feedback on the results of the questionnaire (90% agree/fully agree) and the set-up of the consensus meeting as good (92% agree/fully agree)(Table 7). During the consensus meeting, participants indicated that reflecting on the MIRA results increased the practical value and impact of the approach as it supports the journey to become innovation ready. Some participants indicated at the end of the meeting that the insight they now have into innovation readiness would lead to more positive scores on the MIRA Questionnaire. Besides that, participants stated that the diversity of attendees was

of value for the discussion. Furthermore, they were positive about the group reflection and discussion on innovation readiness. Especially when colleagues joined the consensus meeting whom they had never met before or discussed innovation readiness with. If participants evaluated that the composition of participants in the consensus meeting was not appropriate, then they usually remarked that the presence of senior management was lacking, or more healthcare professionals should have attended (because of the importance of the subject).

Table 7 Acceptability and suitability of the MIRA Consensus meeting

Closed questions	Mean (5-point Likert scale)	Median	SD	% agree / fully agree
The composition of the group of participants in the consensus meeting was appropriate	3.9	4.0	0.72	78
The feedback of the results of the MIRA Questionnaire was understandable	4.3	4.0	0.60	90
I liked the set-up of the consensus meeting	4.3	4.0	0.57	92

Added value of MIRA Questionnaire & Consensus meeting

Participants rated the added value of both the MIRA Questionnaire and the MIRA Consensus meeting as good (>80% agree and fully agree)(Table 8). Seventy-seven percent of the participants believe that extra (external) assistance is needed for conducting the consensus meeting. During the consensus meetings, participants expressed interest in repeating MIRA annually to monitor their innovation readiness maturity. Furthermore, they said that to accelerate learning, they would like to discuss innovation readiness with other long-term care organizations. At all 10 MIRA Consensus meetings, organizations discussed possible next steps toward innovation readiness.

Table 8 Added value of MIRA Questionnaire & Consensus meeting

Closed questions	Mean (5-point Likert scale)	Median	SD	% agree / fully agree
Consensus meeting				
Due to the consensus meeting, we know better where we stand in terms of innovation readiness	4,2	4	0.63	88
Consensus meeting & Questionnaire				
I now have more insight into factors that are important for innovation readiness	4,1	4	0.66	84
I would recommend this approach (questionnaire plus consensus meeting) to other organizations	4,1	4	0.66	84
Our organization could have conducted the questionnaire and led the consensus meeting (without external support)	2,7	3	1.15	23

Discussion

The goal of this study was to examine the perceptions of long-term care professionals regarding the feasibility of the Maastricht Innovation Readiness Approach (MIRA) in Dutch long-term care organizations. The objective was to evaluate the MIRA approach, which combines a framework, questionnaire, and consensus meeting to assess and facilitate innovation readiness.

Main findings show that long-term care professionals perceive MIRA as useful and relevant for enhancing their organization's innovation readiness. The participants were positive about both MIRA's contribution to insights into the organization's innovation readiness maturity and the appropriateness for use. The time it took to complete the MIRA Questionnaire was considered acceptable, and the 'good' intra-rater reliability indicates that the questions and scoring options are clear and well understood. Another important finding is that participants emphasized the relevance of the MIRA Consensus meeting. They appreciated discussing the results of the organization's innovation readiness maturity in the presence of a broad selection of healthcare professionals. Innovation readiness concerns a diversity of functions in the organization (6), and participants valued the opportunity to discuss innovation with colleagues with whom they rarely interact about innovation readiness. Tidd et al. (34) demonstrate that reflecting on results together (rather than individually) may foster a shared understanding of the organization's innovation enablers and barriers. In addition, Haraldseid et al. (42) show that group reflection supports collaborative learning and that especially creating space for reflection enhances individual, team, and organizational learning (43). According to Halcomb et al. (43), a meaningful consensus meeting combines available information and facilitates the consensus process between the participants, thereby increasing their ownership and engagement. Altogether, the MIRA Consensus meeting provides insight into the organization's innovation readiness, identifies where the organization's opportunities for innovation readiness lie, and may support gradual progress in building innovation readiness in a structured way.

Interestingly, all organizations rated themselves as having modest innovation readiness, suggesting cautious self-evaluation (all organizations scored 'consistently' highest at the overall innovation readiness score and a numeric rating of 6.6 (mean) for the perceived innovation readiness). These scores may suggest that professionals in the 10 organizations were careful and nuanced in assessing the innovation readiness of their organizations. Larsson et al. (44) discovered that such moderate scoring is not uncommon in organizational evaluations. Particularly in complex domains, participants in certain roles may lack full visibility into all relevant aspects, leading them to give more cautious or moderate ratings (9, 45). Besides that, in an earlier study, we showed (29) that stakeholders in long-term care organizations often have varying perspectives on innovation readiness, influenced by their roles and access to information, which might lead to a flattened score. Overall, our findings suggest that the modest innovation readiness scores may reflect not a lack of readiness per se, but rather the complexity of innovating in practice and variation in perspectives across organizational roles and levels.

This raises the question of whether MIRA, as a self-assessment instrument, should be able to distinguish between organizations with different levels of innovation readiness. Self-assessment instruments, such as MIRA, may face limitations in precisely differentiating innovation readiness levels; their main added value may be found when used for reflection or development, rather than as an instrument for producing comparative scores (46, 47). Innovation readiness is context-dependent, shaped by factors such as an organization's strategic direction, leadership, and learning climate. These factors differ between organizations, and what is considered 'ready' in one context may not be sufficient in another. Consequently, innovation readiness should be viewed and interpreted as a situational assessment, rather than as an objective benchmark. To encourage unbiased responses, it is important to emphasize that MIRA, being a subjective self-assessment of an organization's innovation readiness, is not designed for benchmarking purposes. This underscores the importance of combining the MIRA Questionnaire with structured dialogue in the MIRA Consensus meeting to substantiate scores and expand participants' shared understanding.

Participants valued both the MIRA Questionnaire and the Consensus meeting. However, while all organizations expressed intentions to improve their innovation readiness, it remains unclear whether and to what extent conducting MIRA leads to improvement of the innovation readiness of long-term care organizations. Additional instruments may be needed to help organizations develop more systematic and long-term approaches to improving innovation readiness (48, 49). Future research should include longitudinal studies to follow organizations that implement steps to improve innovation readiness and to explore how these efforts contribute to successful innovation outcomes. Simultaneously, the applicability of MIRA across various long-term care settings, including disability care, maternity care, and rehabilitation services, warrants further research (50). A pilot study testing the comprehension and clarity of MIRA could be valuable. The materials developed for MIRA in long-term care (Framework, Questionnaire, and Consensus meeting) are readily available for replication in these diverse contexts. Ultimately, driving progress in innovation readiness requires continued integration of research, practice, and policy (10, 24).

Strengths and limitations

Several strengths and limitations of this study should be taken into consideration. First, this study was conducted at ten diverse long-term care organizations (small, medium, and large) with a wide geographical spread in the Netherlands. The purposive sampling ensured variation in organizational size and context. The broad selection of healthcare professionals (representing different organizational levels, roles, and functions) was particularly appreciated by participants of the consensus meeting. A strength of the study is the use of an online MIRA Questionnaire and a predefined structure for the MIRA Consensus meeting. MIRA was executed by one researcher (MWH), who ensured consistency in implementation across all participating organizations. Additionally, the combination of quantitative (Likert-scale data) and qualitative (open-ended questions)

methods enabled a nuanced evaluation of MIRA's feasibility in practice. As the study focused on Dutch long-term care organizations, the identified feasibility of MIRA may, therefore, differ for organizations in other healthcare sectors within or outside the Netherlands. The purposive sampling may have introduced selection bias in terms of organizational interest or readiness to innovate.

Implications for practice and research

The purposive sampling may have introduced selection bias, as organizations interested in this study might score higher on innovation readiness factors. This means the results may not be representative of the experiences of organizations that are less focused on innovation. Consequently, perspectives from organizations with less interest in innovation might be missing. This restricts the applicability of the findings to other contexts, as the sample only represents a specific group of innovation-oriented organizations. Therefore, more research is needed to understand how innovation readiness develops across a broader range of long-term care organizations.

At the organizational level, management may integrate MIRA into their strategic plans to repeat the assessment annually, informing a systematic long-term strategy for innovation readiness. During the MIRA Consensus meetings, participants indicated an interest in repeating MIRA annually to monitor the development of their innovation readiness. For this purpose, the development of MIRA in responsiveness, to detect changes in innovation readiness over time, (51) is needed. Although organizations found the support of an external facilitator helpful in the consensus meetings, building internal capacity to conduct these themselves could strengthen learning within the organization and make it easier to repeat the use of MIRA.

Based on participants' feedback on the MIRA Questionnaire - specifically its terms, explanations, instructions, and design - the findings indicate promising conditions for broader-scale use of MIRA. To support annual, independent, and practical use of MIRA, we intend to develop an online version of the MIRA Questionnaire, accompanied by a scoring interpretation guide and a facilitation guide for the MIRA Consensus meetings (52, 53). We propose conducting interviews with future participants to assess the clarity, comprehension, acceptability (such as ease of administration), and suitability of the online version. For future use, MIRA may benefit from automating data analyses to improve efficiency, particularly when scaling up.

Conclusion

In today's society, organizations need to be able to effectively organize the important factor 'innovation' to sustain their contribution to providing the best possible care and working conditions in long-term care. To the best of our knowledge, the Maastricht Innovation Readiness Approach (MIRA), which was iteratively developed in close collaboration with stakeholders in long-term care organizations, is one of the first instruments to enable self-assessment of healthcare organizations' current state of

innovation readiness. The feasibility study shows that MIRA enhances internal awareness and reflection, helps organizations to identify areas for improvement, and supports more strategic steps toward strengthening innovation readiness. With further development and integration into everyday practice, MIRA presents a promising instrument for fostering innovation readiness in long-term care. MIRA could help organizations to better navigate the complex challenges of innovation and may contribute to more responsive, sustainable, and high-quality of care. Future research could follow organizations over time to explore whether and to what extent conducting MIRA contributes to the improvement of innovation readiness of long-term care organizations.

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Appendices

Appendix 1. MIRA Framework: figure shows an overview of key factors contributing to innovation readiness.

Appendix 2. Intra-rater reliability MIRA questionnaire (ICC estimates, 95% CI, absolute-agreement, 2-way mixed-effects model)

	t1		t2		ICcorrelation		95% confidence interval			
							Lower bound		Upperbound	
overall	Not	9,2	Not	8,5	Single	0,992	Single	0,947	Single	0,999
	Informal	14,8	Informal	14,9	Average	0,996	Average	0,996	Average	0,999
	Occasionally	23,4	Occasionally	23,2						
	Usually	30,1	Usually	32,2						
	Consequent	12,3	Consequent	11,5						
	No insight	10,3	No insight	9,8						
Q1	Not	1,7	Not	,0	Single	0,906	Single	0,477	Single	0,986
	Informal	15,7	Informal	11,3	Average	0,950	Average	0,646	Average	0,993
	Occasionally	28,7	Occasionally	21,7						
	Usually	38,3	Usually	52,2						
	Consequent	14,8	Consequent	12,2						
	No insight	0,9	No insight	2,6						
Q2	Not	3,5	Not	3,5	Single	0,905	Single	0,475	Single	0,986
	Informal	15,7	Informal	7,8	Average	0,950	Average	0,644	Average	0,993
	Occasionally	20,9	Occasionally	18,3						
	Usually	40,9	Usually	54,8						
	Consequent	16,5	Consequent	13,0						
	No insight	2,6	No insight	2,6						
Q3	Not	11,3	Not	10,4	Single	0,929	Single	0,586	Single	0,990
	Informal	7,8	Informal	7,0	Average	0,963	Average	0,739	Average	0,995
	Occasionally	20,0	Occasionally	16,5						
	Usually	28,7	Usually	34,8						
	Consequent	20,0	Consequent	18,3						
	No insight	12,2	No insight	13,0						
Q4	Not	4,3	Not	6,1	Single	0,923	Single	0,556	Single	0,989
	Informal	10,4	Informal	11,3	Average	0,960	Average	0,714	Average	0,994
	Occasionally	15,7	Occasionally	18,3						
	Usually	29,6	Usually	26,1						
	Consequent	4,3	Consequent	9,6						
	No insight	35,7	No insight	28,7						
Q5	Not	13,9	Not	10,4	Single	0,802	Single	0,120	Single	0,970
	Informal	16,5	Informal	20,9	Average	0,890	Average	0,215	Average	0,985
	Occasionally	21,7	Occasionally	19,1						
	Usually	33,0	Usually	26,1						
	Consequent	9,6	Consequent	17,4						
	No insight	5,2	No insight	6,1						
Q6	Not	7,8	Not	2,6	Single	0,938	Single	0,630	Single	0,991
	Informal	13,0	Informal	10,4	Average	0,968	Average	0,773	Average	0,996
	Occasionally	27,8	Occasionally	33,9						
	Usually	33,0	Usually	30,4						
	Consequent	12,2	Consequent	14,8						
	No insight	6,1	No insight	7,8						
Q7	Not	1,7	Not	1,7	Single	0,998	Single	0,988	Single	1,000
	Informal	15,7	Informal	16,5	Average	0,999	Average	0,994	Average	1,000
	Occasionally	33,0	Occasionally	33,0						
	Usually	38,3	Usually	39,1						
	Consequent	9,6	Consequent	9,6						
	No insight	1,7	No insight	,0						
Q8	Not	1,7	Not	2,6	Single	0,913	Single	0,510	Single	0,987
	Informal	12,2	Informal	13,0	Average	0,955	Average	0,675	Average	0,994
	Occasionally	33,0	Occasionally	22,6						
	Usually	40,9	Usually	39,1						
	Consequent	11,3	Consequent	20,9						
	No insight	,9	No insight	1,7						
Q9	Not	6,1	Not	6,1	Single	0,814	Single	0,154	Single	0,972
	Informal	7,8	Informal	12,2	Average	0,897	Average	0,267	Average	0,986
	Occasionally	28,7	Occasionally	15,7						
	Usually	34,8	Usually	47,0						
	Consequent	12,2	Consequent	8,7						
	No insight	10,4	No insight	10,4						
Q10	Not	11,3	Not	11,3	Single	0,949	Single	0,684	Single	0,993
	Informal	15,7	Informal	11,3	Average	0,974	Average	0,812	Average	0,996
	Occasionally	13,9	Occasionally	16,5						
	Usually	32,2	Usually	34,8						
	Consequent	13,9	Consequent	12,2						
	No insight	13,0	No insight	13,9						

Appendix 2. continued

Q11	Not	21,7	Not	17,4	Single	0,772	Single	0,042	Single	0,965
	Informal	14,8	Informal	13,9	Average	0,871	Average	0,080	Average	0,982
	Occasionally	19,1	Occasionally	24,3						
	Usually	17,4	Usually	20,9						
	Consequent	8,7	Consequent	4,3						
	No insight	18,3	No insight	19,1						
Q12	Not	9,6	Not	8,7	Single	0,932	Single	0,599	Single	0,990
	Informal	13,9	Informal	11,3	Average	0,965	Average	0,749	Average	0,995
	Occasionally	19,1	Occasionally	23,5						
	Usually	31,3	Usually	33,0						
	Consequent	14,8	Consequent	10,4						
	No insight	11,3	No insight	13,0						
Q13	Not	10,4	Not	7,0	Single	0,969	Single	0,800	Single	0,996
	Informal	15,7	Informal	20,9	Average	0,984	Average	0,889	Average	0,998
	Occasionally	36,5	Occasionally	37,4						
	Usually	22,6	Usually	20,9						
	Consequent	5,2	Consequent	5,2						
	No insight	9,6	No insight	8,7						
Q14	Not	3,5	Not	2,6	Single	0,994	Single	0,956	Single	0,999
	Informal	18,3	Informal	17,4	Average	0,997	Average	0,977	Average	1,000
	Occasionally	17,4	Occasionally	20,9						
	Usually	46,1	Usually	46,1						
	Consequent	13,0	Consequent	13,0						
	No insight	1,7	No insight	,0						
Q15	Not	1,7	Not	2,6	Single	0,910	Single	0,498	Single	0,987
	Informal	13,9	Informal	8,7	Average	0,953	Average	0,665	Average	0,993
	Occasionally	20,0	Occasionally	22,6						
	Usually	30,4	Usually	35,7						
	Consequent	23,5	Consequent	17,4						
	No insight	10,4	No insight	13,0						
Q16	Not	,0	Not	,0	Single	0,978	Single	0,851	Single	0,997
	Informal	13,9	Informal	11,3	Average	0,989	Average	0,919	Average	0,998
	Occasionally	7,0	Occasionally	11,3						
	Usually	43,5	Usually	46,1						
	Consequent	29,6	Consequent	24,3						
	No insight	6,1	No insight	7,0						
Q17	Not	1,7	Not	,9	Single	0,887	Single	0,400	Single	0,983
	Informal	8,7	Informal	12,2	Average	0,940	Average	0,572	Average	0,992
	Occasionally	14,8	Occasionally	22,6						
	Usually	37,4	Usually	39,1						
	Consequent	20,9	Consequent	19,1						
	No insight	16,5	No insight	6,1						
Q18	Not	11,3	Not	12,2	Single	0,680	Single	-0,153	Single	0,948
	Informal	11,3	Informal	18,3	Average	0,809	Average	-0,362	Average	0,973
	Occasionally	18,3	Occasionally	18,3						
	Usually	33,0	Usually	23,5						
	Consequent	13,9	Consequent	15,7						
	No insight	12,2	No insight	12,2						
Q19	Not	2,6	Not	6,1	Single	0,987	Single	0,913	Single	0,998
	Informal	10,4	Informal	8,7	Average	0,994	Average	0,955	Average	0,999
	Occasionally	18,3	Occasionally	19,1						
	Usually	36,5	Usually	36,5						
	Consequent	28,7	Consequent	26,1						
	No insight	3,5	No insight	3,5						
Q20	Not	6,1	Not	10,4	Single	0,891	Single	0,415	Single	0,984
	Informal	19,1	Informal	13,9	Average	0,942	Average	0,586	Average	0,992
	Occasionally	22,6	Occasionally	23,5						
	Usually	25,2	Usually	25,2						
	Consequent	7,0	Consequent	9,6						
	No insight	20,0	No insight	17,4						

Appendix 2. continued

Q21	Not	4,3	Not	1,7	Single	0,981	Single	0,874	Single	0,997
	Informal	15,7	Informal	20,9	Average	0,991	Average	0,933	Average	0,999
	Occasionally	27,8	Occasionally	27,0						
	Usually	40,0	Usually	41,7						
	Consequent	11,3	Consequent	8,7						
	No insight	,9	No insight	,0						
Q22	Not	5,2	Not	4,3	Single	0,963	Single	0,761	Single	0,995
	Informal	15,7	Informal	19,1	Average	0,981	Average	0,865	Average	0,997
	Occasionally	28,7	Occasionally	33,0						
	Usually	33,9	Usually	29,6						
	Consequent	6,1	Consequent	6,1						
	No insight	10,4	No insight	7,8						
Q23	Not	14,8	Not	15,7	Single	0,967	Single	0,789	Single	0,995
	Informal	18,3	Informal	18,3	Average	0,983	Average	0,882	Average	0,998
	Occasionally	33,0	Occasionally	28,7						
	Usually	24,3	Usually	28,7						
	Consequent	6,1	Consequent	5,2						
	No insight	3,5	No insight	3,5						
Q24	Not	9,6	Not	8,7	Single	0,907	Single	0,484	Single	0,986
	Informal	16,5	Informal	17,4	Average	0,951	Average	0,652	Average	0,993
	Occasionally	26,1	Occasionally	24,3						
	Usually	21,7	Usually	27,8						
	Consequent	9,6	Consequent	7,0						
	No insight	16,5	No insight	14,8						
Q25	Not	7,8	Not	8,7	Single	0,990	Single	0,933	Single	0,999
	Informal	26,1	Informal	25,2	Average	0,995	Average	0,965	Average	0,999
	Occasionally	28,7	Occasionally	27,0						
	Usually	27,0	Usually	26,1						
	Consequent	8,7	Consequent	8,7						
	No insight	1,7	No insight	4,3						
Q26	Not	11,3	Not	9,6	Single	0,964	Single	0,770	Single	0,995
	Informal	16,5	Informal	20,0	Average	0,982	Average	0,870	Average	0,997
	Occasionally	25,2	Occasionally	24,3						
	Usually	24,3	Usually	25,2						
	Consequent	8,7	Consequent	7,8						
	No insight	13,9	No insight	13,0						
Q27	Not	9,6	Not	7,8	Single	0,943	Single	0,655	Single	0,992
	Informal	12,2	Informal	19,1	Average	0,971	Average	0,792	Average	0,996
	Occasionally	32,2	Occasionally	31,3						
	Usually	27,0	Usually	25,2						
	Consequent	8,7	Consequent	7,8						
	No insight	10,4	No insight	8,7						
Q28	Not	22,6	Not	19,1	Single	0,929	Single	0,584	Single	0,990
	Informal	12,2	Informal	13,9	Average	0,963	Average	0,737	Average	0,995
	Occasionally	23,5	Occasionally	24,3						
	Usually	14,8	Usually	14,8						
	Consequent	8,7	Consequent	7,0						
	No insight	18,3	No insight	20,9						
Q29	Not	11,3	Not	9,6	Single	0,966	Single	0,782	Single	0,995
	Informal	17,4	Informal	19,1	Average	0,983	Average	0,878	Average	0,998
	Occasionally	28,7	Occasionally	27,0						
	Usually	24,3	Usually	27,0						
	Consequent	7,8	Consequent	5,2						
	No insight	10,4	No insight	12,2						
Q30	Not	36,5	Not	38,3	Single	0,917	Single	0,528	Single	0,988
	Informal	19,1	Informal	10,4	Average	0,957	Average	0,691	Average	0,994
	Occasionally	12,2	Occasionally	18,3						
	Usually	3,5	Usually	7,8						
	Consequent	3,5	Consequent	1,7						
	No insight	25,2	No insight	23,5						
Q31	Not	20,0	Not	17,4	Single	0,527	Single	-0,378	Single	0,917
	Informal	20,0	Informal	19,1	Average	0,690	Average	-1,215	Average	0,957
	Occasionally	21,7	Occasionally	14,8						
	Usually	18,3	Usually	32,2						
	Consequent	11,3	Consequent	9,6						
	No insight	8,7	No insight	7,0						

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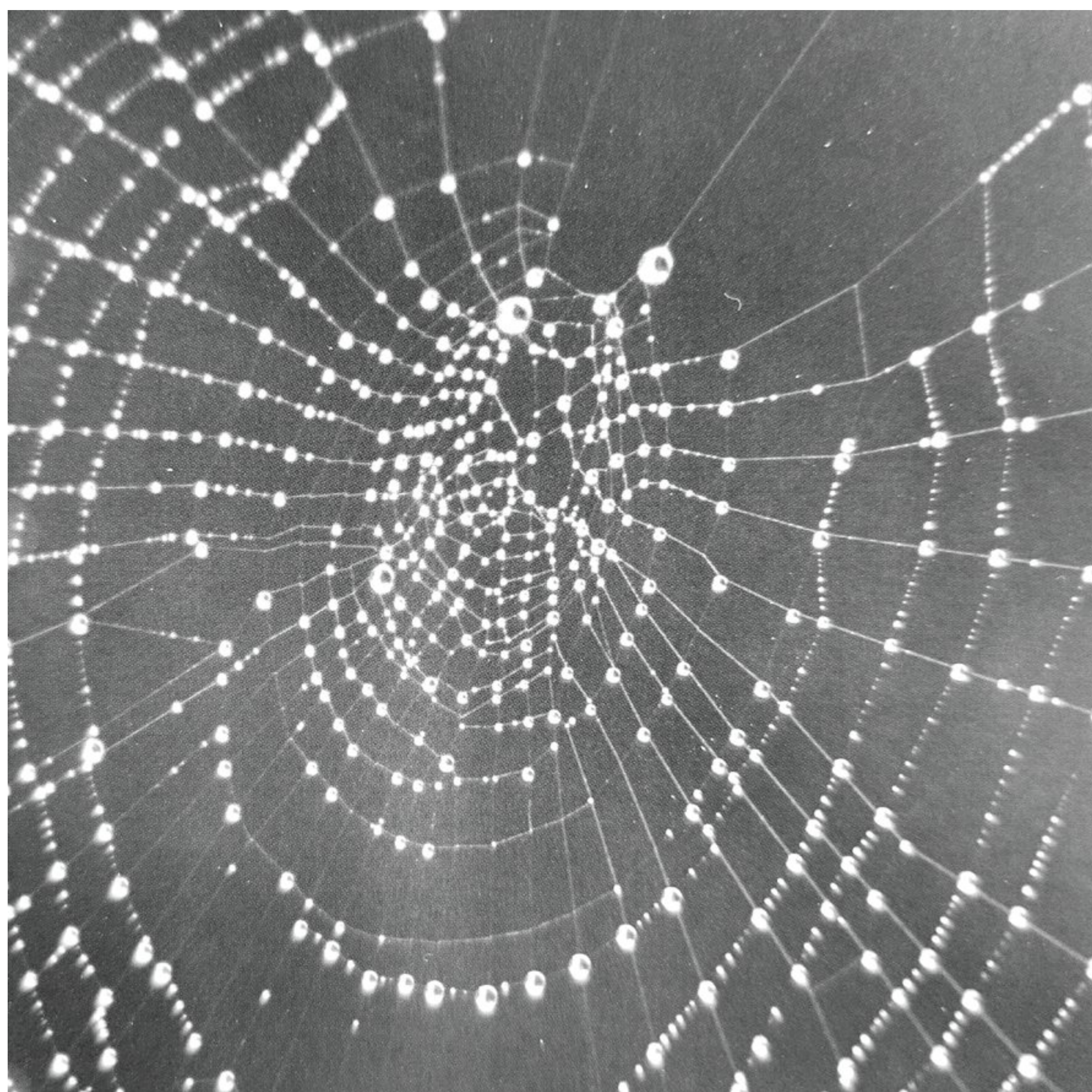
Appendix 3. Set-up MIRA Consensus meeting

This table provides a detailed agenda (time - content) of the set-up of the MIRA Consensus meeting.

Agenda for Consensus Meeting		
5 min	Introduction (brief)	What are your expectations? (Create name tags)
5 min	Agenda Overview	Explanation of Objectives: 1) Understanding Innovation Readiness (IR), 2) Feedback on IR within your organization, 3) Reaching a shared understanding. The last objective may be too ambitious; the primary goal is to interpret the level of innovation maturity as a collective starting point.
		Feedback on the Four Main and Sub-Domains. Then, discussion of key findings within the main domains.
5 min	Background / Research on the Questionnaire	Explanation of the questionnaire's background / innovation readiness factors. All factors of the Innovation Readiness Framework are essential. Their interrelation is crucial; you cannot innovate effectively by implementing only half of the factors.
15 min	Feedback Session	Per (sub)domain at the organizational level. Identify notable observations, such as wide variation, lack of visibility, or differing levels of maturity within subfactors of a domain.
40 min	Discussion of Domains with Large Variance	Discussion of key points regarding the variance in results. Purpose of the discussion: How did this happen? What impact does this have on innovation? Why do opinions differ strongly on certain factors? A. Why do we have a lot of agreement on certain factors? For example, if something is well-organized, ask for concrete examples. B. On the factors where we score lower: What is the urgency? Is it causing problems? Ask about the background; for example, are there no agreements made? What evidence is there in terms of policy and actions?
10 min	Determining the General and Domain-Specific Level of Innovation Readiness	Consensus Discussion Is reaching consensus desirable? Discussion on potential gaps in knowledge, communication, or development stage Insights from the collective assessment of innovation readiness.
10 min	Evaluation and Next Steps	Reflection on the MIRA approach. Completion of the paper evaluation Discussion on action perspectives. What do you need for the next steps? Work session / Brainstorm/ next steps on the four domains / priorities
Participants		Representation of participants who completed the questionnaire Diversity: Strategic/tactical/operational – caregivers/support staff/medical
Setting		Conducted at the long-term care organization
Execution		Discussion with the coordinator. Results sent to the coordinator in advance for further distribution. Results presented with follow-up questions for reflection. Process facilitation in consultation with the care organization's coordinator.
Objectives (from a research perspective)		Collect Participant Reflections: feedback on quality and process of questionnaire and consensus meeting. Evaluate Against MIRA Goals/Assess how well the process aligns with the objectives of MIRA
Steps consensus meeting		Present findings from self-assessment Engage in dialogue to interpret the results Aim for a shared understanding of the organization's position on innovation readiness

5



CHAPTER 6

Innovation readiness maturity of long-term care organizations in the Netherlands - insights from the Maastricht Innovation Readiness Approach (MIRA) – Brief report

EMBARGO

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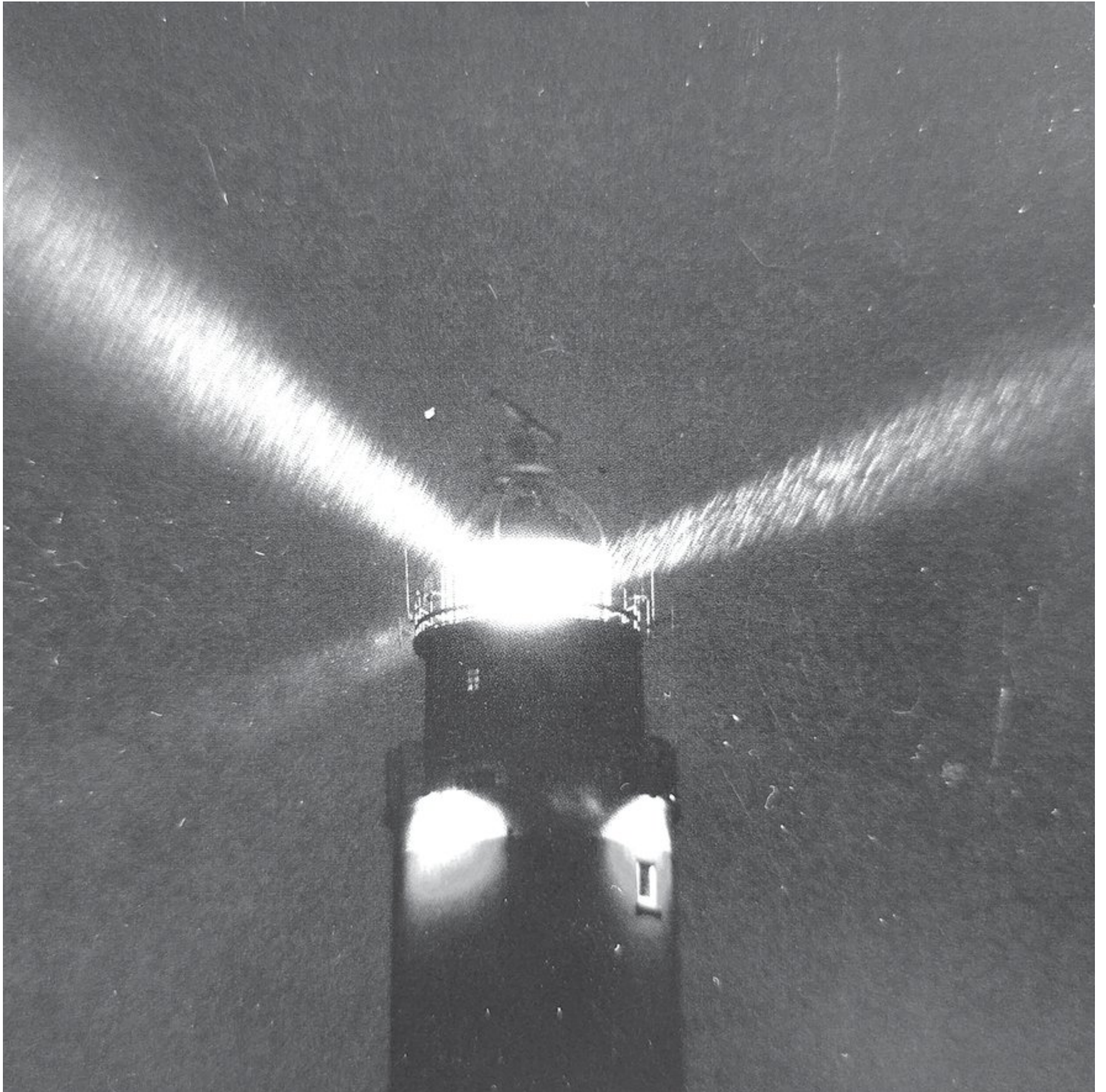

CHAPTER 7

General discussion

The overall aim of this dissertation was to advance our understanding of innovation readiness in long-term care and to develop an approach for organizations to assess it. Understanding how key factors contribute to innovation readiness can support organizations in long-term care to organize and systematically integrate innovation into their strategy.

Specifically, the research questions of this dissertation were:

1. Which key factors contribute to innovation readiness in long-term care organizations for older adults?
2. How can long-term care organizations be supported in assessing innovation readiness?
3. What insights and patterns of innovation readiness can be observed across Dutch long-term care organizations?

To answer these questions, the research in this dissertation consisted of three phases, each involving different studies and research methods. In the first phase (Chapters 2-4), a scoping review was conducted, and stakeholders (n = 46) in long-term care shared their opinions on key innovation readiness factors through both qualitative and quantitative methods, including interviews and a Q-methodology study. In the second phase (Chapter 5), the Maastricht Innovation Readiness Approach (MIRA) was developed collaboratively with stakeholders, and its feasibility was tested through a mixed-method cross-sectional study in 10 Dutch long-term care organizations (total respondents, n = 127). In the final phase (Chapter 6), a cross-sectional study was conducted across 21 long-term care organizations (total respondents, n = 409) in the Netherlands to gain insights into and identify patterns of their innovation readiness. In this concluding chapter, the main findings of the research presented in this dissertation are summarized, followed by a reflection on the methodological and theoretical choices made throughout this work. The chapter concludes with implications for future policy, practice, research, and education.

MAIN FINDINGS

This dissertation resulted in three major results: a definition of innovation readiness, an innovation readiness framework, and an approach to assess innovation readiness. We defined innovation readiness as "the level of maturity of an organization to succeed in any type of innovation and encompasses the entire innovation cycle." This deliberately highlights that readiness extends beyond introducing or adopting specific innovations (Chapter 2). We developed the innovation readiness framework (Chapter 5 Appendix 1: Figure 1) based on all the factors that contribute to the innovation readiness of long-term care organizations for older adults (Chapters 2-4). The key factors can be grouped into four main domains:

1. strategic direction: the organization's long-term strategy, infrastructure, and communication;
2. organization of innovation: innovation deployment through organization, processes, external contacts, and the learning agenda;
3. leadership for innovation: management's attitude and behavior toward innovation; and
4. learning climate: an environment that encourages learning and reflection on innovation.

To support long-term care organizations in assessing innovation readiness, we iteratively developed the Maastricht Innovation Readiness Approach (MIRA) based on the innovation readiness framework and developed in close collaboration with stakeholders in long-term care (Chapter 5). MIRA is designed to support healthcare professionals and organizations in integrating innovation readiness into their daily practices. This approach includes a self-assessment questionnaire and a consensus meeting. Our feasibility study showed that MIRA was perceived as acceptable, suitable, and of added value, as well as providing useful insights into organizations' innovation readiness. The MIRA Questionnaire offers organizations insights into their current innovation readiness, encouraging reflection and dialogue during the consensus meeting. By collectively reflecting on these results, professionals share different perspectives, identify strengths, and identify areas for improvement to enhance the organization's innovation readiness.

Applying the MIRA Questionnaire across 21 Dutch long-term care organizations showed that 20 of 21 organizations situated themselves at a moderate innovation readiness position. The results also highlighted difficulties in integrating organizing for innovation into daily routines, despite supportive structures and ambitions (Chapter 6).

METHODOLOGICAL CONSIDERATIONS

In this section, methodological strengths and limitations are discussed. It begins by covering the study design and participant recruitment. It also addresses considerations related to MIRA's added value.

Study design: exploratory research

In this dissertation, we intentionally chose an exploratory research design (1, 2) to explore and understand innovation readiness and to develop an approach for organizations to assess it. This methodological approach was chosen for several reasons.

First, innovation readiness in healthcare remains an under-theorized concept, with no widely accepted tools for its assessment (3, 4), unlike implementation science, which has a rich and established body of conceptual models, validated frameworks, and empirical evidence to guide research and practice (5, 6). A flexible and open methodology was therefore necessary to explore and understand the concept before attempting to assess it (1). Second, after we defined our research aim (7), the exploratory research enabled iterative learning, with insights from the scientific and grey literature, expert consultation, multi-phase stakeholder engagement, and empirical findings continuously informing and refining our understanding (8, 9). This facilitated the emergence of insights, such as the absence of existing definitions, frameworks, or validated instruments for assessing innovation readiness in healthcare (8, 9).

Third, this design is well-suited for developing a concept and framework that contribute to innovation readiness in practice (10-12). Therefore, it made sense to co-create with practice by involving a wide range of stakeholders (13-15). Additionally, this design is suitable for long-term care because it helps clarify the complex interactions among multiple factors and stakeholder perspectives (16, 17), thereby increasing the relevance and impact of the research outcomes (18, 19). An alternative approach to this dissertation's goal would have been to use a model such as the knowledge-to-action (KTA) framework proposed by Graham et al. (19). The KTA framework explains how research knowledge is put into practice through two interconnected parts. The knowledge creation part emphasizes developing and customizing knowledge, while the action cycle describes the steps for applying it in real-world settings. Using this model could have provided several benefits. First, it could have offered procedural guidance with a more transparent process to move from theoretical insights to practice. The KTA framework's systematic cycle of knowledge creation and action phases would have provided clear milestones throughout the research, thus making it easier to track progress. Second, the framework includes structured action cycles that could have guided the design and evaluation of interventions, possibly speeding up the translation of findings into long-term care practices. Third, the KTA framework could also have guided a broader study to define the concept of innovation readiness and map existing knowledge related to innovation, organizational change, and readiness.

Participant recruitment: influence on internal and external validity

The sampling strategy used in this dissertation's research faced methodological challenges that might have influenced both the accuracy of results within the studied organizations (internal validity) and the generalizability of the findings across the long-term care sector (external validity) (20). Although these limitations are common in real-world organizational research, a closer look reveals the tension between methodological rigor and practical feasibility.

The first challenge was avoiding selection bias that could lead to a sample that may not accurately reflect the target population (20). This bias possibly appeared in two ways: innovation-interested professionals were invited to participate in the studies, and innovation-oriented organizations were intentionally selected to develop and implement the innovation readiness framework and MIRA. This purposeful sampling created a methodological paradox: it allowed us to reach a variety of experts and motivated participants, but it also excluded perspectives that could have challenged or improved our understanding of innovation readiness. The need for organizational approval and participant willingness naturally restricts access to critical or dissenting voices. The studies may reflect the opinions of individuals who with more open or positive attitudes toward innovating, while those with more critical views might have been less likely to participate (21, 22).

The risk remains that professionals and organizations more interested in innovation were overrepresented, which could lead to an incomplete innovation readiness framework or overly optimistic estimates of innovation readiness in long-term care (20, 23). The MIRA sampling strategy intentionally excluded several groups: external partners, healthcare staff not directly involved in innovation activities, residents, and family members. While this exclusion was pragmatically justified by the assumption that they lacked sufficient insight into the organization's innovation readiness, it may have overlooked essential perspectives. As a result, this could limit both the completeness of the findings (internal validity) and their applicability to more diverse organizational contexts (external validity). Furthermore, we cannot rule out the possibility that the sampling strategy, at both the individual and organizational levels, affected the study results in this dissertation.

The second challenge involved potential detection bias in the studies (Chapters 2-5) used for framework development and in innovation-focused organizations conducting MIRA. Detection bias occurs when responses and results are measured or interpreted differently across groups (24). Variations between functions, roles, organizational locations, departments, and hierarchical levels could lead to different interpretations of innovation readiness factors (8), our interview questions (8, 9), and the response options in the MIRA Questionnaire (17). These possible differences might suggest that innovation readiness may not represent a single, uniform organizational construct, but rather a set of perceptions shaped by employees' roles, experience, and proximity to innovation activities (9).

The third challenge involved the self-report nature of the MIRA Questionnaire, which is vulnerable to social desirability bias (25). Respondents might provide answers that reflect positively on their organization rather than their actual practices or experiences. This could lead to systematic overestimation of an organization's innovation readiness (25).

To reduce bias, several strategies were used (20). First, to minimize both selection and detection bias, transparent inclusion criteria were applied and reported, ensuring representation of diverse stakeholder perspectives, including large and small organizations and those with varying levels of innovation experience. Furthermore, participants in the studies and in innovation-focused organizations that conducted MIRA were intentionally varied in positions, roles, backgrounds, and organizational contexts.

Second, to reduce selection bias at the organizational level, we used broad sampling through employers' organizations in care and welfare, the Living Lab in Ageing and Long-Term Care, and the research team's network (26, 27). Deliberate efforts were also made to include not only healthcare professionals who actively promote, advocate for, and drive the adoption of new practices but also less engaged voices, such as healthcare staff and client representatives. Ensuring that different viewpoints were represented may have helped to decrease selection bias and strengthen both the internal and external validity of the findings (28).

Third, to mitigate social desirability bias, data were collected anonymously, and consensus meetings were held to reflect and promote open discussion and support the collective validation and refinement of the findings. These strategies together could have improved the credibility and robustness of the results, despite the methodological challenges inherent in real-world organizational research (25, 26).

Evaluating the added value of MIRA

The methodological design used to develop MIRA provides valuable insights into designing and evaluating assessment tools within organizational settings. The main goal of MIRA is to promote organizational dialogue and reflection rather than to serve as a traditional "measurement" instrument. The latter would be designed to provide objective and standardized scores for a specific construct. Its main purpose would be to measure this construct as accurately as possible, aiming to reflect an underlying "true value." To achieve this, such instruments focus on construct and criterion validity as well as reliability testing to ensure precise measurement (29, 30).

MIRA, on the other hand, was designed to highlight perspectives, stimulate dialogue, and support shared understanding in specific organizational contexts (31). Because of this, the emphasis shifted toward practicality, usability, and MIRA's ability to generate meaningful discussion. The development of MIRA's self-assessment questionnaire was intentionally guided by established methodological quality guidelines, including the definition of constructs, the design of items, and pilot testing (13, 32). Attention was paid to ensure face validity and content validity, and inter-rater reliability was considered to enhance rigor (33).

However, positioning MIRA to promote dialogue and reflection has important methodological implications. First, validity, in this context, refers less to alignment with external standards and more to whether the instrument captures relevant dimensions of innovation readiness and stimulates meaningful organizational dialogue (32, 33). Second, in the same way, reliability does not require the production of identical numerical scores but ensuring that the tool consistently facilitates comparable reflective processes across different organizational settings (34). Third, feasibility, or the tool's instrument’s practical usability and ability to generate actionable insights, thus becomes the main criterion for evaluation (30). This methodological perspective, in our opinion, justifies the decision against conducting extensive construct or criterion validity testing for MIRA. Instead, the development process emphasized practical usability and the instrument’s ability to generate structured dialogue during consensus meetings. Although this approach differs from traditional psychometric standards, it aligns with the goal of encouraging organizational learning and decision-making through collective reflection rather than precise measurement of innovation readiness as a quantifiable construct.

At the same time, this methodological choice requires careful consideration of how MIRA is applied and interpreted. First, the MIRA results do not represent absolute truths. The MIRA Questionnaire reveals how individuals within an organization perceive its innovation readiness. Individuals from different roles, departments, and backgrounds may interpret the same innovation readiness factors differently. Reflecting on these differences is helpful because it allows the organization to notice varying perspectives and start an open conversation about how to work and learn better together.

Second, methodologically, MIRA is not specifically developed to compare organizations’ innovation readiness positions (35) and should be used cautiously when making direct comparisons across organizations. Long-term care organizations operate in diverse contexts, including varying resident populations and geographic regions, and they face varied resource challenges. Therefore, comparisons across organizations require careful interpretation, as responses can hide significant differences in context and resources. Nonetheless, organizations might learn from each other by comparing how various innovation readiness domains are addressed and developed in practice.

THEORETICAL CONSIDERATIONS

This section reflects on the studies in this dissertation. First, a reflection on the concept of innovation readiness is made. Second, the added value of the innovation readiness maturity framework is discussed in more detail. The "effect" of innovation readiness is also addressed.

The concept of innovation readiness: perspectives on professional innovating

This dissertation aimed to support long-term care organizations in understanding innovation readiness in long-term care and to provide a practical way for organizations to assess it and embed innovation in their strategy. This understanding might support professionals and organizations in becoming better at organizing for innovation. The research in this dissertation started with a general definition of innovation readiness (Chapter 2): "it indicates the level of maturity of an organization to succeed in any type of innovation and encompasses the entire innovation cycle" (8). A significant contribution of this dissertation is the development of the innovation readiness framework, illustrated in Chapter 5 Appendix 1, as no validated innovation scans (8, 36-38) or prior conceptual frameworks were available for healthcare purposes. This innovation readiness framework provides an initial, structured approach by mapping key factors and offering insights for organizations to become better at innovating.

Several foundational ideas underpin the innovation readiness concept, the framework, and the corresponding MIRA Questionnaire that require understanding (39). These guide how we have conceptualized innovation readiness, how the framework is structured, and how the questionnaire is designed to support reflection within organizations.

First, the concept of innovation readiness is not seen as a one-time activity but as a core part of the organization's overall direction and strategic priorities (8, 22). Enabling innovation cannot be separated from organizational development and transformation. Generally, organizing for innovation requires rethinking how the organization is structured and governed (22, 40). Furthermore, creating conditions for innovation (organizing for innovation) and embracing structural change (innovating the organization itself) are interconnected processes; they support each other (41, 42).

Second, innovation readiness is not the same as preparing to implement a specific innovation (3, 4). While the latter involves a particular step in the innovation process (22), innovation readiness includes the proactive ability and maturity to continuously engage in and sustain innovation over time (8). Organizations can improve their innovation readiness by engaging in various activities throughout the innovation process (22). This can include involving staff and clients early in idea development, testing and refining innovations in practice, learning from pilots, and enhancing internal structures such as leadership support, cross-team collaboration, or data use. Innovation readiness is not limited to implementing a specific innovation;

it also involves building skills, routines, and conditions that enable the organization to innovate more effectively over time (8, 43).

Third, we assume that the interconnectedness among the innovation readiness factors is essential. We observe that although these factors are closely linked and mutually influence one another, there appears to be no definitive path to becoming innovation ready (9). We view innovation readiness not as the sum of separate factors, but as an interconnected system where progress in one area, such as leadership or the learning climate, can either enable or hinder progress in others (43, 44).

Fourth, the MIRA response options assume that organizations that intentionally plan, organize, conduct, and learn from efforts to support innovation in daily practice might improve their innovation readiness (22, 45, 46). With that, we assume that organizations that encourage knowledge sharing, offer room for new approaches, and promote reflection eventually have a better chance of becoming innovation ready and being successful in innovating (47-49). This assumption is consistent with theory about learning organizations (50-52).

Finally, we assume that various contextual factors, such as an organization's size, ambition, and structure, influence how innovation readiness is organized to achieve success (6, 50, 53). While Janssen et al. (54) focused on innovation processes rather than innovation readiness, their work illustrates that the meaning and value of innovations emerge within specific organizational and social contexts. This aligns with broader research showing that context influences an organization's ability to build and maintain the factors it needs for innovation, such as resources, routines, and opportunities to learn (50, 55). Because innovation readiness reflects an organization's level of maturity for succeeding with any type of innovation rather than the execution of a specific innovation, it is plausible that contextual conditions shape, enable, or constrain how it develops over time. Although this relationship has not been directly examined, existing research suggests that contextual variation may contribute to differences in how organizations build and maintain innovation readiness.

However, a critical question remains: How distinct is the definition of innovation readiness from existing concepts related to innovation in healthcare? The concept of innovation readiness (8) shares similarities with established organizational concepts such as (organizational) readiness for innovation (56), innovation capability (57), and innovation capacity (58). All these concepts focus on (a) specific stages of the innovation process: either development (57), implementation (58), or adoption (56), and (b) on a specific innovation. For example, the implementation of a new health program (56). Innovation readiness differs from these concepts in that it focuses on continuously creating the organizational conditions to embed innovating into daily practice. Innovation readiness emphasizes preparing key factors throughout the entire innovation cycle, regardless of the type of innovation, which may provide an additional perspective on existing theories (8).

Innovation readiness maturity

The maturity positions (Table 2, Chapter 5) in MIRA describe "innovation readiness maturity" and may provide a complementary theoretical perspective to current healthcare research. Implementation science frameworks (6, 53) and the scoping review on innovation readiness (8) show that there is no existing conceptualization of innovation readiness in terms of developmental or maturity positions. MIRA's maturity positions are based on several underlying assumptions that require closer examination and clarification (24, 39). The assumptions outlined below influenced how we defined innovation readiness maturity and how we developed the response options in the MIRA Questionnaire. The question is how and whether these assumptions will hold in practice.

First, we assume that the maturity positions (Table 2, Chapter 5) outline an organization's path to achieving innovation readiness. They are inspired by maturity models found in business literature (37, 59) and consist of three interconnected elements: frequency, agreements, and learning. The frequency of agreement executions shows how regularly efforts to organize and support innovation are applied and integrated into daily practice (22). The aspect of embedding innovation through agreements helps sustain strategic focus and integrates innovation into the organization's long-term learning (22). The component of learning is a core element of becoming and remaining innovation ready. It enables organizations to continuously adapt, develop new skills, and refine routines in response to emerging challenges and opportunities (22). Learning within and across organizational boundaries helps spread knowledge and supports the adoption and integration of innovations into daily practice (22, 60). Maturity in the positions is most likely observed in practice when the organization is stable, supportive, and encourages learning (61, 62). Conversely, maturity in positions is less likely in settings with high workloads, limited resources, weak leadership, or fragmented structures (41, 42, 63).

Second, we assume that MIRA's maturity positions support organizations in identifying which domains are most advanced and where further improvement is needed. The assumption is that responses to "occasionally," "consistently," and "optimally" indicate that there are agreements in place on these factors, and that applying them more frequently could help strengthen innovation readiness. This is supported by Teece (64), who showed that organizations build stronger innovation capabilities when key routines, like coordinating work, learning together, and improving processes, are carried out more regularly and in a more structured way. The responses for "informal" encourage organizations to consider formalizing policies and routines, as they are crucial to embedding innovation, as long as they allow room for experimentation and feedback (22, 65). Efforts to increase the use of agreements or formalize routines might not enhance innovation practices if leadership offers little support or if organizational learning is not prioritized. This strategy is only likely to be effective when the organization provides staff with the time, space, and encouragement to implement these routines effectively and sustainably (66-68).

Third, we assume that organizations can learn from one another by comparing how different innovation readiness domains are addressed and developed in practice.

Research shows that a key way for organizations to learn from one another is through the active involvement of both intended users and those responsible (e.g., managers) for implementing innovations within organizations (27, 69). Whether these assumptions hold true in practice depends on how open and supportive the organizational environment is for cross-organizational learning. Organizations with high workloads, limited capacity, or weak learning cultures may struggle to participate in exchanges and translate lessons learned from others into their daily practices. The success of learning from other organizations largely depends on whether conditions allow staff to reflect, engage, and apply insights in a meaningful and sustainable way (70, 71). Although it remains uncertain whether these assumptions will be confirmed in practice, MIRA's maturity positions could still provide a valuable addition to current healthcare research. Currently, they seem to support organizations in assessing innovation readiness and encourage collective learning (72).

The research, including the development of the MIRA framework into a questionnaire, a consensus meeting, and discussions with various groups, sharpened, refined, and expanded our original definition (8): "innovation readiness is the degree to which an organization purposefully organizes the conditions for innovation, embeds them in agreements and daily practices, and continuously strengthens its innovation capacity through evaluation and learning". It encompasses all phases of the innovation process and is independent of the type of innovation. This expanded definition captures our current understanding and may still require refinement over time. Consistent with our approach, innovation readiness is understood as an ongoing capacity rather than a fixed endpoint, reflecting an organization's ability to engage in and be prepared for innovation. Within the application and underlying principles of MIRA, innovation readiness is regarded as a process of organizing, acting, and adjusting, based on the idea of a learning organization where deliberate attention is given to all contributing factors and their interrelatedness. In short, the emphasis lies on the deliberate and goal-oriented organization of innovation and its translation into everyday practice.

The "effect" of innovation readiness

Innovation readiness establishes the structural conditions necessary for innovation to occur. This dissertation's research could support organizations to understand, assess, and reflect on their innovation readiness. The question remains whether MIRA genuinely supports organizations in strengthening their innovation readiness. The research in this dissertation offers preliminary insights suggesting that MIRA may contribute to innovation readiness, but only under certain circumstances.

First, our research indicates that conducting MIRA helps develop a shared internal innovation readiness language, which may facilitate internal dialogue and support learning (17). Research has shown that discussion and learning positively affect innovation (51, 52, 73). The reflections prompted by MIRA appear to serve as early mechanisms for awareness-building, enabling organizations to transition from unawareness of their innovation limitations to actively developing the activities and skills needed to address them.

Second, research has shown that organizations that use assessments are more likely to achieve successful change and better outcomes (74, 75). Openly discussing results and sharing different perspectives helps improve organizational learning and innovation (45, 61). MIRA's consensus meetings support this by improving sensemaking, creating shared interpretations, and building organizational knowledge. This aligns with research on learning organizations, which indicates that organizations are more capable of learning, adapting, and innovating when shared practices and reflection are part of routine daily work (61, 76).

Third, MIRA helps identify readiness gaps and thereby provides concrete suggestions for improvement. The four domains of the innovation readiness framework (Chapter 5 Appendix 1) assist organizations in assessing their current position, thus supporting strategic innovation planning (17). Actionable plans based on these insights could help enhance innovation readiness (36, 77). This effect could be further strengthened when organizations discuss their results with other organizations and learn from the initiatives taken by others to become better at innovating (52).

Fourth, integrating MIRA into other strategic organizational processes, such as annual strategic planning, may increase its impact (36, 78). This integration might also involve a wide range of internal stakeholders in completing the questionnaire, participating in the consensus meeting, and carrying out follow-up actions. Embedding MIRA into existing decision-making routines could therefore enhance its practical relevance.

Fifth, MIRA's contribution may partly depend on the organizational models that influence innovation potential (64-68). Certain organizational structures, especially those emphasizing adaptability, learning, and openness, are most supportive of an innovative culture. In management research, adhocracy-oriented organizations, characterized by an adaptive style, are linked to flexibility, risk-taking, and creativity, all of which support innovating (69) - for example through project-based structures that enable teams to act quickly and collaborate across disciplines. Similarly, ambidextrous organizations that combine exploring new opportunities with leveraging existing practices enable both incremental and radical innovation (70). Organizations with strong dynamic capabilities, those that can adapt, integrate, and reconfigure resources, are also considered innovation-oriented (71). In healthcare, research has shown that learning organizations are more likely to sustain innovations by embedding continuous reflection and improvement into their structure and culture (47, 49). Although our studies did not classify organizations according to these types, it seems likely that each organization has developed an organizational model that fits its specific context and way of working.

The innovation readiness framework and MIRA provide a structured foundation for proactive decision-making, but they do not guarantee success unless organizations actively engage with the insights and incorporate them into their broader learning and innovation process. In summary, the potential "effect" of strengthening innovation readiness, as outlined in the innovation readiness framework and assessed through MIRA, remains uncertain. It is still unknown whether improvements in these domains might lead to more sustainable innovations in everyday practice. It is also unclear how such effects can be reliably and practically measured beyond the current assessment

of innovation readiness. Future research might therefore examine how changes in innovation readiness, identified through the framework and MIRA, relate to innovation outcomes and determine which methodological approaches are best for evaluating these relationships over time.

IMPLICATIONS

This dissertation has several implications for policy, practice, research, and education.

Implications for policy

In the Netherlands, a nationwide public policy update, the "Outline Agreement of Older Adults" (Hoofdlijnenakkoord Ouderenzorg), has emerged that closely aligns with the principles of investing time and resources in systematically organizing for innovation (79). Quality of life for older adults remains the main focus. However, there is growing recognition that high-quality care increasingly depends on an organization's readiness and ability to develop, adapt, adopt, and sustain innovative approaches (80, 81). Additionally, initiatives such as "Dignity and Pride for the Future" (Waardigheid en Trots voor de toekomst) (82) support long-term care organizations in becoming more future-ready through knowledge sharing, spreading good practices, and creating cross-organizational learning networks. Organizations that are innovation ready also tend to be better able to implement innovations. This capacity may contribute to a more stimulating work environment for healthcare professionals (9, 83) and can strengthen organizational attractiveness as an employer in a competitive labor market (84). Policy initiatives focused on building innovation readiness can thus address both innovation goals and workforce sustainability (83, 84). These policies acknowledge that innovation in long-term care is essential, not optional, for addressing structural challenges such as workforce shortages, rising care demands, and financial pressures (85, 86). In this context, innovation readiness becomes a strategic driver for turning policy goals into lasting practice changes.

To capitalize on these developments and ensure alignment between national policies and organizational practices, we have developed several policy recommendations to enhance innovation readiness across the sector.

First, data collected through MIRA, available on the online MIRA Portal and database, can offer valuable insights at the national level (Chapter 10 Appendix B: impression of the MIRA Portal). Together, these data can identify patterns and trends that are important for policymakers and sector-wide learning about innovating in long-term care (72).

Second, policymakers could encourage and invite long-term care organizations to shift from an implementation-focused approach toward strategies that prioritize innovation readiness, aligning with their organizational goals. The Ministry of Health, Welfare and Sport, Zorgverzekeraars Nederland (the umbrella organization of health insurers in the Netherlands), ZonMw, and the Dutch Research Council could therefore

link national quality indicators, such as “The Generic Compass” (Het Generiek Kompas) (87), and additional funding schemes to assessments of innovation readiness. This could help ensure that being prepared for innovation is increasingly recognized as a relevant qualification for receiving innovation subsidies or participating in national programs.

Third, the Ministry of Health, Welfare, and Sport could fund existing and new sector-wide learning networks to assist organizations with varying innovation readiness maturity sharing knowledge, tools, and lessons learned. This may support sector-wide innovating instead of limiting efforts to isolated pilot projects. At the start of 2026, Maastricht University, on behalf of the Living Lab of Ageing and Long-term Care and Zuyd University of Applied Sciences (88), signed a cooperation agreement with RegioPlus, a network of 12 organizations partially funded by the Ministry of Health, Welfare, and Sport. This partnership enables the nationwide (digital) availability of MIRA, supporting its systematic use in health and social care organizations. With additional funding, MIRA could be implemented more broadly, thereby increasing its impact on innovation in healthcare systems.

Implications for practice

Long-term care organizations could use the innovation readiness framework to guide their strategy, focusing on its key factors and finding a good balance among them within their overall priorities. This might require these organizations to fundamentally shift from focusing on implementation to adopting broader strategies for innovation readiness. Additionally, assessments like MIRA can support these organizations in continuously monitoring, adapting, and improving their innovation readiness with management, staff, and stakeholders. To support this, we have developed several practical suggestions.

First, prioritizing innovation readiness requires board members to clearly communicate innovating as a strategic priority, thus ensuring employees understand and experience innovation as both vital and non-negotiable (9). This means that top managers should consistently support innovation initiatives, especially when challenges arise, while continuously integrating innovation into their daily routines.

Second, leading innovation in long-term care requires full participation from healthcare staff and management at all levels (8), as innovation readiness involves functions across the whole organization (89). Organizations might therefore actively encourage and involve all employees in their efforts to organize and support innovation in daily practices. For example, caregivers and nurses play a crucial role as key contributors in developing and implementing innovations (8, 90). Their early involvement would not only increase the relevance and feasibility of new practices but also boost ownership and commitment, which are vital for successful adoption and long-term sustainability (9, 91, 92). Additionally, inclusive approaches that value diverse professional perspectives promote a culture of shared responsibility and collective learning, further strengthening an organization’s innovation ability (9, 48, 93). Human

resource departments might also incorporate principles of innovation readiness into their current training programs, emphasize learning and reflection as essential skills.

Third, organizations could actively invest in their learning culture, which is important for improving innovation, by establishing practical routines for shared learning, experimentation, and dialogue (9, 48, 82, 94). This dissertation's research showed that participants especially valued in MIRA the chance to discuss innovating with colleagues they rarely interact with, particularly concerning innovation readiness. Tidd and Bessant (22) demonstrated that collective reflection promotes a shared understanding of the organization's innovation enablers and barriers.

Finally, it could be beneficial for long-term care organizations to include innovation readiness in their strategic planning to support high-quality care and respond to changing needs (95, 96). They could use the innovation readiness framework and an assessment approach like MIRA not only for one-time assessments but also annually, as part of a continuous improvement process within learning trajectories, team development, or strategic renewal. Therefore, setting a clear strategic direction for innovation and organizing it effectively might receive the same rigor and attention as managing and improving care itself (90, 97).

Implications for research

In this dissertation, an innovation readiness definition, an innovation readiness framework, the MIRA Questionnaire, the MIRA Consensus meeting, the MIRA Portal and database were developed to advance, assess, and strengthen innovation readiness in long-term care. Building on these results, we identify several specific directions for future research.

First, innovation readiness is primarily seen as an organizational-level concept; however, it can also apply to subunits, professional teams, or cross-organizational collaborations. Teams and subunits often operate with different leadership styles, resources, and cultures, which can either support or hinder innovation, even within the same organization (8, 97). Additionally, interprofessional teams are increasingly recognized as settings where new practices are developed and tested, which makes team-level readiness a key factor in innovation outcomes (9, 98). At the same time, health and social care innovations often involve multiple organizations, such as networks of long-term care providers, hospitals, insurers, and municipalities. In these cases, network readiness (99) becomes just as important as readiness within individual organizations (100). Further research at these levels can help strengthen and expand the theoretical foundation of the innovation readiness concept.

Second, to develop the innovation readiness framework into a more explanatory model, a next step could be to examine the interactions among these factors. Although stakeholders preferred to start with formulating the innovation ambition, there is no definitive path to becoming innovation ready (8, 9). Discussing which elements are fundamental versus consequential, or how they might influence one another, might lead to a deeper understanding. Exploring these interdependencies could also clarify how organizations build and sustain innovating over time (99, 100). Such insights would

help explain why some organizations progress more rapidly in developing innovation readiness than others, even when similar factors are present.

Third, future research could examine how changes in innovation readiness relate to innovation outcomes and determine which methodological approaches are best for evaluating these relationships over time. Innovation outcomes are seen as a measurable result of an organization's innovation efforts in improving healthcare delivery and results (101). These results may rely on how innovation readiness factors are applied in practice (as shown in Chapter 5 Appendix 1: Figure 1) and might, for example, be evaluated by measuring outputs (innovations introduced, scaled, or maintained) and impact (quality of care, staff satisfaction, and efficiency) (22, 97). The potential value of strengthening innovation readiness, as outlined in the innovation readiness framework and assessed through MIRA, is still unknown. It is uncertain whether improvements in these domains might lead to more sustainable innovations in everyday practice. Additionally, it is unclear how such effects can be reliably and practically measured beyond the current assessment of innovation readiness.

Fourth, our findings suggest that MIRA has potential for broader use in various healthcare settings (17). Future research could examine its clarity, usability, and acceptability among participants, as well as the added value of digital or automated features to improve efficiency and enable wider implementation.

Implications for education

Preparing healthcare professionals to understand and apply the concept of innovation readiness is crucial for strengthening the ability of long-term care organizations to adapt and improve. Education plays a key role in improving this awareness. For this, several possible directions can be considered.

First, courses could include innovation readiness knowledge for students in health and social care. Such curriculum integration might be especially important for nursing programs, health sciences education, and management training. Teaching students to recognize and assess innovation readiness factors would support them in understanding that innovating is not just an isolated project but part of a long-term strategy for organizations. For example, students could analyze a long-term care organization using the innovation readiness framework and reflect on their own role within it.

Second, interprofessional training among long-term care professionals could promote shared responsibility for innovation (102, 103). When professionals from fields such as innovation, nursing, medicine, therapy, social work, and management learn together, they can examine questions like: How can new ideas be integrated into daily care? What support do professionals need to implement and improve these ideas? This approach reflects real practice in long-term care, where innovation develops through teamwork across different disciplines.

Third, leadership development programs for healthcare professionals might explicitly emphasize innovation readiness as a relevant competency. By equipping current and future managers with the skills to facilitate cross-professional collaboration

and align innovation goals with strategic priorities, organizations can promote leadership that actively manages, sustains, and scales innovation (9, 104). These programs could also include knowledge of and practical application of the innovation readiness framework, enabling leaders to use it as a guiding tool for organizing, monitoring, and strengthening efforts to support innovation in daily practice.

Finally, knowledge institutes and educational programs could put innovation readiness into practice by adopting flexible teaching methods, encouraging experimentation, and building partnerships with care organizations. Collaborating with practice settings would let students see how readiness develops over time and contributes to better care outcomes.

Conclusion

This dissertation's research has improved the understanding of innovation readiness in long-term care by defining the concept, developing a framework to identify key factors, and providing a systematic approach to assess innovation readiness in long-term care organizations for older adults.

Additionally, MIRA showed that Dutch long-term care organizations assess themselves at a moderate innovation readiness position. The findings highlighted challenges in integrating the organization and management of innovation into daily routines, although they have supportive structures and ambitions. Reflecting as an organization and as a team on what already works well and what could be improved could help create a learning organization with stronger, more effective, innovation-ready plans and strategies.

Building on this, future research and practice on innovation readiness could advance organizational abilities to anticipate and address challenges in healthcare and society. The next step for long-term care organizations might be to go beyond just implementing and adopting individual innovations and focus on organizing and managing the factors that contribute to innovation readiness as part of their long-term vision and strategy.

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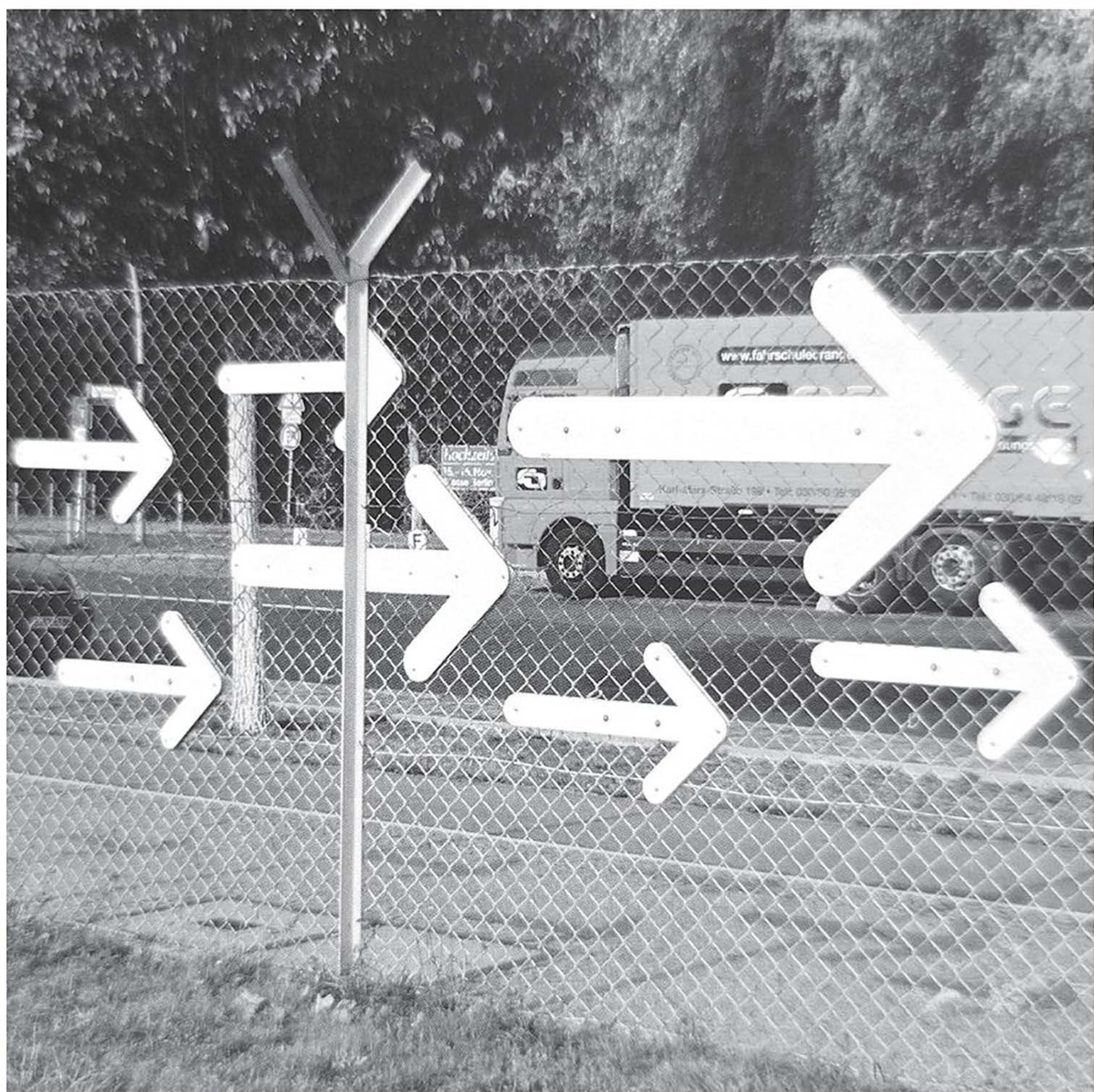

CHAPTER 8

Summary
Advancing innovation readiness in long-term care

Samenvatting
Op weg naar innovation readiness in de ouderenzorg

Long-term care organizations increasingly rely on innovating to respond to rising demand, workforce shortages, and resource limitations. Many innovations fail to reach their intended outcomes due to a lack of strategic direction, limited staff involvement, and insufficient structures for learning and evaluation. Organizations aiming to improve their innovation abilities might benefit from understanding and assessing the concept of *innovation readiness*. From there, they can develop targeted strategies to improve it. To increase innovation readiness, it is crucial to identify how ready for innovation long-term care organizations are. This requires understanding the key factors that contribute to innovation readiness and developing an assessment approach. The overall goal of this dissertation was therefore to advance understanding of innovation readiness in long-term care and to develop an approach for organizations to assess it (Figure 8.1).

This dissertation resulted in the development of a definition of innovation readiness, an innovation readiness framework, and a feasible and valuable assessment method: the Maastricht Innovation Readiness Approach (MIRA). MIRA consists of a self-assessment questionnaire and a consensus meeting where the questionnaire results are collectively reflected upon. MIRA is carried out by (care) professionals involved in innovation who have sufficient insight into their organization's innovation readiness. A key element of this approach is that it provides organizations with insights into their current innovation readiness, thus encouraging reflection and dialogue during the consensus meeting. By collectively reflecting on these results, professionals can share different perspectives, identify strengths, and identify areas for improvement to enhance the organization's innovation readiness.

Figure 8.1 Advancing the understanding of and assessing the innovation readiness

The innovation readiness framework and MIRA can be valuable tools for many stakeholders in long-term care organizations. MIRA provides organizations with a structure for identifying starting points and guiding ongoing improvement efforts. Further, they can help boards and executive leaders consider how innovation readiness aligns with long-term strategy and daily priorities. For managers and team leaders, the framework guides them in examining how innovation is organized, communicated, and supported throughout the organization. Healthcare professionals, clients, and relatives may find it beneficial because MIRA emphasizes their early involvement,

thereby strengthening the relevance and practicality of innovations. Human resource departments might use these insights to more explicitly incorporate learning, reflection, and experimentation into professional development. For regional and national learning networks, MIRA can help highlight patterns and support cross-organizational learning. Policymakers could use aggregated MIRA data to better understand developments across the sector. Such insights could help funders and subsidy providers evaluate how innovation readiness can support the success of innovations. Knowledge institutes and universities might also find the framework helpful for designing practice-based research on innovating in long-term care. For education, the framework offers concepts that can be incorporated into curricula to help students understand how innovation is organized in real practice settings.

Taken together, the framework and MIRA provide a shared structure and approach that may help stakeholders move toward more deliberate, coordinated, and sustainable efforts to improve innovation readiness. Each chapter in this dissertation has contributed to developing the framework and MIRA, as explained in more detail in the rest of this summary.

Chapter 1 introduces the need for innovation readiness in long-term care. Despite this need, Chapter 1 shows that many innovations fail to achieve their intended outcomes due to a lack of strategic direction, limited staff involvement, and insufficient learning and evaluation agreements and structures. These challenges underscore the need for organizations to strengthen their innovation readiness, a concept increasingly recognized in healthcare but lacking a clear definition, framework, or approach to assess it. The chapter ends by presenting the aims and outline of the dissertation.

In Chapter 2, we present the results of a scoping review of studies examining factors that contribute to innovation readiness in healthcare organizations. Innovation readiness is defined as "the level of maturity of an organization to succeed in any type of innovation and encompasses the entire innovation cycle." It emphasizes that innovation readiness extends beyond just introducing or adopting specific innovations. Building on 44 included studies, the review identified 10 sub-factors grouped into four main domains: strategic course for innovation, climate for innovation, leadership for innovation, and commitment to innovation. Additionally, a preliminary framework outlining the innovation readiness factors is presented, serving as a conceptual foundation for subsequent empirical chapters.

In Chapter 3, we describe the results of an interview study with Dutch stakeholders to gain insights into the factors contributing to the innovation readiness of long-term care organizations for older adults. The insights from 16 semi-structured interviews with academics, (top) managers, innovation managers, and consultants refined and operationalized the domains identified in the scoping review. The analysis results in an adapted innovation readiness framework. Stakeholders emphasized that innovation readiness should not be developed as an ad hoc initiative but should be embedded in corporate strategies and decision-making processes. Additionally, they highlighted

the importance of "preparing" the organization for innovation readiness and fostering professional "learning for innovation."

In Chapter 4, we present the results of a Q-methodology study that examines whether stakeholders agree with the innovation factors identified in Chapter 3, which aspects of innovation readiness they prioritize, and where their perspectives diverge. Thirty stakeholders connected to long-term care for older adults in the Netherlands – including academics, (top) management, innovation managers, client representatives, staff, and consultants - were included. They ranked 36 statements, and the analysis revealed four distinct perspectives: the supportive role of management; participation of the client system and employees; setting the course and creating conditions; and structuring decision-making, roles, and responsibilities. These perspectives confirmed that all 36 factors were considered relevant, and no factors were missing from the framework.

In Chapter 5, we present a cross-sectional study examining the feasibility of MIRA across 10 Dutch long-term care organizations. This approach includes a self-assessment questionnaire and a consensus meeting. MIRA was iteratively developed in collaboration with stakeholders in long-term care and is based on the innovation readiness framework. The framework identifies four main domains:

1. strategic direction: the organization's long-term strategy, infrastructure, and communication;
2. organization of innovation: innovation deployment through organization, processes, external contacts, and the learning agenda;
3. leadership for innovation: management's attitude and behavior toward innovation; and
4. learning climate: an environment that encourages learning and reflection on innovation.

The study shows that MIRA is a feasible approach for assessing innovation readiness in long-term care. The MIRA Questionnaire provides organizations with insights into their current innovation readiness, encouraging reflection and dialogue during the consensus meeting. By collectively reflecting on these results, professionals share different perspectives, identify strengths, and recognize areas for improvement to enhance the organization's innovation readiness. However, it remains unclear whether conducting MIRA improves innovation readiness.

In Chapter 6, the results of a descriptive cross-sectional study are presented, examining how Dutch long-term care organizations assess their innovation readiness using the MIRA Questionnaire. Based on data from 409 professionals across 21 organizations, the study presents innovation readiness maturity positions for each (sub)domain of the framework. The maturity position "consistently" was selected most often, indicating that many organizations are beginning to formalize innovation-related practices, especially in strategic directions. However, the learning climate emerged as the least mature domain, suggesting that these innovation-readiness factors are not yet fully embedded.

In Chapter 7, the dissertation's main findings are presented. Additionally, the chapter discusses methodological and theoretical considerations, with implications for policy, practice, research, and education. It provides an expanded definition: "innovation readiness is the degree to which an organization purposefully organizes the conditions for innovation, embeds them in agreements and daily practices, and continuously strengthens its innovation capacity through evaluation and learning". The concept encompasses all phases of the innovation process and is independent of the type of innovation. The chapter also demonstrates how the expanded definition of innovation readiness, along with the framework, MIRA, the MIRA Portal (Chapter 10 Appendix B: Impression of the MIRA Portal), and the national database, enhances understanding of innovation readiness and makes it more visible and actionable within long-term care.

Finally, Chapter 9 highlights the societal and scientific importance of this dissertation by demonstrating how innovation readiness is translated from theory to practice and how it provides a foundation for the ongoing management of innovation in long-term care. The chapter details impact at three levels: output, outcome, and impact. It also covers the implications for society and science, the dissemination of results, and future perspectives.

SAMENVATTING

Zorgorganisaties die verpleging, verzorging en thuiszorg bieden, hierna ouderenzorgorganisaties genoemd, zetten innoveren steeds vaker gericht in om de stijgende zorgvraag, personeelstekorten en beperkte middelen het hoofd te bieden. Veel innovaties behalen hun doelen niet door een gebrek aan strategische richting, beperkte medewerkersbetrokkenheid en onvoldoende structuren voor leren en evalueren. Voor organisaties die hun vermogen om te innoveren willen versterken, is het waardevol om inzicht te hebben in het concept *innovation readiness* en in de mate waarin zij hierin ontwikkeld zijn. Met dit inzicht kunnen zij gerichter werken aan verbetering. Om beter te worden in innoveren, is het nodig om te bepalen hoe 'innovation ready' een organisatie is. Daarvoor is inzicht nodig in de factoren die bijdragen aan innovation readiness, evenals een aanpak om de mate van innovation readiness binnen organisaties zichtbaar te maken. Het doel van dit proefschrift is om het concept innovation readiness in de ouderenzorg beter te begrijpen en een aanpak te ontwikkelen waarmee organisaties dit kunnen beoordelen (Figuur 8.1).

Dit proefschrift heeft geleid tot een definitie van innovation readiness, een bijbehorend framework en een haalbare en waardevolle aanpak om innovation readiness te beoordelen: de Maastricht Innovation Readiness Aanpak (MIRA). MIRA bestaat uit een zelfevaluatie door middel van een vragenlijst en een consensusbijeenkomst waarin de resultaten gezamenlijk worden besproken. MIRA wordt uitgevoerd door (zorg)professionals die betrokken zijn bij innoveren en voldoende (in)zicht hebben om te kunnen reflecteren op de innovation readiness van hun organisatie. Een kernonderdeel van deze aanpak is dat organisaties inzicht krijgen in hun mate van innovation readiness. Door gezamenlijk te reflecteren op de uitkomsten van de vragenlijst kunnen professionals verschillende perspectieven inbrengen, sterke punten herkennen en gerichte verbeterkansen identificeren om de innovation readiness van de organisatie te versterken.

Figuur 8.1: Het verdiepen van het begrip en het in kaart brengen van innovation readiness

Het innovation readiness framework en MIRA kunnen van toegevoegde waarde zijn voor verschillende doelgroepen in de ouderzorgorganisaties. MIRA biedt organisaties een structuur om te bepalen waar zij staan en om verbeterstappen te sturen. Bestuurders en directie krijgen zicht op hoe innovation readiness past binnen de langetermijnstrategie en dagelijkse prioriteiten. Voor managers en teamleiders

biedt het framework houvast om innoveren te organiseren, te communiceren en te ondersteunen. Zorgprofessionals, cliënten en hun naasten kunnen er profijt van hebben dat MIRA benadrukt hoe waardevol hun vroege betrokkenheid kan zijn, wat mogelijk bijdraagt aan de bruikbaarheid van innovaties.

HR-afdelingen kunnen de inzichten benutten om leren, reflectie en experimenteren sterker te verankeren in professionalisering. Regionale en landelijke leernetwerken kunnen met MIRA patronen herkennen en leren tussen organisaties stimuleren. Beleidsmakers kunnen geaggregeerde MIRA-gegevens gebruiken om ontwikkelingen in de sector te duiden. Financiers en subsidieverstrekkers krijgen zicht op hoe innovation readiness het succes van innovaties ondersteunt. Kennisinstituten en universiteiten kunnen het framework gebruiken om praktijkgericht onderzoek naar innoveren in de langdurige zorg vorm te geven. In het onderwijs biedt het framework een gezamenlijke taal en overzicht dat studenten helpt te begrijpen hoe innovatie in de praktijk wordt georganiseerd. Samen vormen het framework en MIRA een gedeelde structuur en aanpak die kan bijdragen aan meer doelgerichte, beter gecoördineerde en duurzamere innovatie-inspanningen. Elk hoofdstuk van dit proefschrift draagt hieraan bij en wordt in deze samenvatting verder toegelicht.

Hoofdstuk 1 laat zien waarom innovation readiness van belang en noodzakelijk is in de langdurige zorg. Veel innovaties behalen hun doelen niet door een gebrek aan strategische richting, beperkte medewerkersbetrokkenheid en onvoldoende afspraken voor leren en evalueren. Deze uitdagingen onderstrepen de noodzaak om innovation readiness te versterken: een concept dat in de gezondheidszorg steeds meer aandacht krijgt, terwijl het begrip nog niet duidelijk is omschreven of uitgewerkt. Het hoofdstuk sluit af met de doelstellingen en opbouw van het proefschrift.

In hoofdstuk 2 worden de resultaten beschreven van een scoping review naar factoren die bijdragen aan innovation readiness in zorgorganisaties. Innovation readiness wordt gedefinieerd als 'hoe 'voorbereid' een organisatie is om succesvol te innoveren in alle stappen van het innovatieproces, onafhankelijk van het type innovatie'. Deze definitie benadrukt dat innovation readiness verder gaat dan alleen het implementeren van specifieke innovaties. De review, gebaseerd op 44 studies, identificeerde tien sub-factoren binnen vier domeinen: strategische koers voor innovatie, innovatieklimaat, leiderschap voor innovatie en betrokkenheid bij innovatie. Een eerste innovation readiness-framework wordt gepresenteerd en vormt de conceptuele basis voor de daaropvolgende empirische studies.

Hoofdstuk 3 laat resultaten zien van een kwalitatieve studie onder Nederlandse stakeholders om inzicht te krijgen in factoren die bijdragen aan innovation readiness van ouderenzorgorganisaties. De 16 interviews met academici, (top)managers, innovatiemanagers en consultants scherpten de factoren en de domeinen uit de scoping review verder aan. De analyse leidde tot een aangepast innovation readiness framework. Respondenten benadrukten dat innovation readiness niet ad hoc ontwikkeld hoeft te worden, maar structureel verbonden zou moeten zijn met strategie en besluitvorming. Ook wezen zij op het belang van het 'voorbereiden' van de organisatie en het leren van innoveren.

In hoofdstuk 4 worden de resultaten gepresenteerd van een Q-methodologie-onderzoek. Dertig deelnemers betrokken bij de ouderenzorg in Nederland: academici, (top)management, innovatiemanagers, clientvertegenwoordigers, medewerkers en consultants rangschikten de 36 factoren uit hoofdstuk 3 in volgorde van belangrijkheid voor de bijdrage aan innovation readiness. Vier verschillende perspectieven over wat zij het meest belangrijk vinden voor innovation readiness kwamen naar voren: 1) ondersteunende rol van het management 2) betrokkenheid van de cliënt (systeem) en de medewerkers 3) koers zetten en randvoorwaarden creëren en 4) het structureren van besluitvorming, rollen en verantwoordelijkheden. Alle 36 factoren bleken relevant en geen extra innovatie readiness factoren kwamen naar voren ten opzichte van die voorheen geïdentificeerd in de literatuur en de interviews.

Hoofdstuk 5 bevat de resultaten van een cross-sectionele (dwarsdoorsnede) studie naar de hanteerbaarheid van de Maastricht Innovation Readiness Aanpak (MIRA) in tien ouderenzorgorganisaties. MIRA is ontwikkeld in co-creatie met stakeholders uit de ouderenzorg en gebaseerd op het innovation readiness framework (uit hoofdstuk 4). Het framework omvat vier domeinen: 1) strategische richting, 2) organisatie van innovatie, 3) leiderschap voor innovatie en 4) leerklimaat. De aanpak bestaat uit een zelfevaluatie door middel van een vragenlijst en een consensusbijeenkomst. De resultaten laten zien dat MIRA goed hanteerbaar is en een werkbare en waardevolle manier is om innovation readiness te beoordelen. De vragenlijst geeft inzicht in de huidige mate van innovation readiness en de consensusbijeenkomsten helpen de organisatie en de deelnemers om perspectieven te verkennen en verbeterpunten te identificeren. Het gebruik van MIRA in de dagelijkse praktijk moet nog laten zien in hoeverre het bijdraagt aan het verbeteren van innovation readiness.

In hoofdstuk 6 worden de resultaten beschreven van een cross-sectionele studie naar hoe Nederlandse ouderenzorgorganisaties hun innovation readiness beoordelen met de MIRA-vragenlijst. De analyse omvatte de data van 21 organisaties (in totaal 409 deelnemers). De uitkomsten tonen innovatie volwassenheids posities per (sub)domein. De positie 'meestal' werd het meest gekozen, wat aangeeft dat veel organisaties bezig zijn met het formaliseren van het organiseren van innovatie-activiteiten, vooral op strategisch gebied. Het domein leerklimaat kwam naar voren als het minst innovatievolwassen, wat erop kan wijzen dat deze factoren nog niet vanzelfsprekend zijn ingebed.

In hoofdstuk 7 worden de belangrijkste bevindingen van het proefschrift samengebracht. Daarnaast worden methodologische en theoretische overwegingen besproken, resulterend in aanbevelingen voor beleid, praktijk, onderzoek en onderwijs. Een aangepaste definitie wordt voorgesteld: innovation readiness is de mate waarin een zorgorganisatie doelbewust randvoorwaarden voor innoveren organiseert, deze verankert in afspraken en het dagelijks handelen, en door evaluatie en leren continu werkt aan haar vermogen tot innoveren. Het betreft alle fasen van het innovatieproces en geldt voor alle type innovaties. Daarnaast beschrijft het hoofdstuk hoe de aangepaste definitie, het innovation readiness framework, MIRA, het MIRA-portaal

(Chapter 10 Appendix B: Impression of the MIRA Portal) en de nationale database bijdragen aan het beter begrijpen, zichtbaar maken en toepassen van innovation readiness in de ouderenzorg.

Tot slot wordt in hoofdstuk 9 de maatschappelijke en wetenschappelijke relevantie van dit proefschrift beschreven, door te laten zien hoe innovation readiness wordt vertaald van theorie naar praktijk en hoe dit een basis biedt voor het blijvend organiseren en managen van innovatie in de langdurige zorg. Het hoofdstuk beschrijft impact op drie niveaus: output, resultaat en impact. Daarnaast gaat het hoofdstuk in op de betekenis voor maatschappij en wetenschap, de verspreiding van de resultaten en toekomstperspectieven.

CHAPTER 9

Impact

"Engaging in dialogue about innovation readiness is extremely valuable. Both the MIRA Questionnaire and the MIRA Consensus meeting provided our organization with important insights: what we already excel at, what we should continue, and where further development is necessary. With relatively little time investment, you gain significant understanding on managing innovation and to create impact truly" (CEO of a participating long-term care organization for older adults, 2025).

This dissertation highlights the societal and scientific importance of innovation readiness by translating theory into practice and creating a foundation for ongoing management of innovation in long-term care. The impact is observed at three levels: output, outcome, and impact. Output includes the tangible products generated by our research, while outcome involves immediate changes in practice, awareness, and policies resulting from the output. Impact signifies the broader, lasting transformation that goes beyond individual studies and organizations. This chapter shows how this dissertation's research developed across outputs, outcomes, and impacts. It also explains what this means for its impact on society, impact in science, sharing the results, and future perspectives.

SOCIETAL IMPACT

Societal impact describes how society interacts with and benefits from the research, such as improving daily practices, policies, health, or public understanding. This dissertation has produced societal impact in several ways.

Output

This dissertation was initiated and funded by the Living Lab in Aging and Long-Term Care at Maastricht University (1). It addresses the expressed need of the nine long-term care organizations in the Living Lab to become better at managing innovation (2). Long-term care professionals highlighted the need for insights and a method to determine their current position, identify strengths, and recognize areas for development to become more innovation ready. As a result, this dissertation developed and evaluated, step by step, a framework and an approach that organizations can use to assess their innovation readiness.

First, to address this practical need, the abstract "academic" concept of innovation readiness was translated, informed by research into the Maastricht Innovation Readiness Framework (Chapter 5 Appendix 1). This framework, available in Dutch, German, and English, provides an overview of key factors and subfactors that contribute to innovation readiness (3-5).

Second, building on this foundation, the Maastricht Innovation Readiness Approach (MIRA) was co-designed with a wide variety of healthcare professionals, long-term care organizations, employer organizations, and regional partners (6) (see Chapter 10 Appendix A: Brief overview of MIRA). The added value of the innovation readiness framework and MIRA was demonstrated through practical application (7-10).

MIRA offers a concrete approach, consisting of a questionnaire and a consensus meeting, that connects research knowledge with the practical needs of long-term care organizations. The MIRA Questionnaire supports organizations in assessing innovation readiness maturity across four domains: strategic direction, organization of innovation, leadership, and learning climate. The MIRA consensus meeting is a structured, two-hour dialogue among professionals involved in innovation within the organization to interpret MIRA Questionnaire results, collaboratively develop shared insights, and identify opportunities to improve innovation readiness.

Third, a manual for using the MIRA Questionnaire, a facilitator guide for the MIRA Consensus meeting (53, 54), and a digital factsheet (PDF) in Dutch (4) were created to support organizations in conducting MIRA independently. Additionally, a comprehensive facilitator training program was developed and delivered in collaboration with the Professional Education Department of Zuyd University of Applied Sciences to improve implementation capacity through organizations such as RegioPlus (12 regional employer associations) and to promote sustainable adoption across the Netherlands. This training recognizes that successful MIRA implementation requires more than just innovation and management knowledge; it also requires a deep understanding of organizational contexts and facilitation skills (11).

Finally, to support frequent (e.g., annual), independent (from the research team) use of MIRA, an online version of the MIRA Questionnaire was developed. The partnership with MEMIC (the Data and Information Management Center of Maastricht University) enabled the creation of an automated web-based platform. The MIRA Portal (Chapter 10 Appendix B: Impression of the MIRA Portal) supports organizations in conducting the MIRA Questionnaire on their own. It also securely stores data and provides real-time reporting.

Outcome

From a broad policy perspective, this dissertation contributes to the ongoing discussion on how to keep long-term care sustainable and to incorporate innovation (12) systematically. More specifically, in the Netherlands and worldwide, governments and healthcare insurers are emphasizing and promoting the use of innovation in long-term care (12-15). International health policy agendas consistently highlight innovating as a crucial strategy for addressing aging populations and resource constraints (16-18). Long-term care organizations recognize the need to become more innovative but often lack awareness of the competencies and preconditions necessary for successful innovation (19, 20). This dissertation's research can therefore be highly relevant to current policy and practice.

First, strategic planning processes in several organizations were guided by MIRA results, which helped refine their approaches to manage innovation (21). Integrating MIRA results into their annual strategic planning processes (22), organizations might turn innovation readiness from an abstract goal into a measurable organizational skill. For example, after conducting MIRA, a long-term organization gathered and developed actionable points into an inspiration plan (22). Additionally, the four domains guided regional long-term care training programs on innovation readiness (23, 24).

Second, more specifically, the consensus meetings promote dialogue among boards, managers, healthcare professionals, caregivers, client councils, and support staff, thereby creating a shared understanding and ownership of innovation readiness. These meetings enable participants to collaboratively discuss strategic alignment, innovation organization, leadership, and learning. Using this combined approach (questionnaire and consensus meeting), organizations learn about their innovation readiness, develop a shared language, and foster a more learning-oriented attitude toward innovating (5, 25, 26).

Third, the MIRA results from over 20 long-term care organizations provide an overview of how Dutch long-term care organizations assess their innovation readiness (5). Furthermore, the combined Dutch data, collected and stored in the MIRA Portal, offer valuable national insights into the state of innovation readiness in the care sector and serve as a national database for ongoing monitoring, thus enabling the tracking of innovation readiness development over time. The portal enables each organization to collect data in a digital format, for example, through a computer, tablet, or phone (11).

Impact

The findings of this dissertation serve the needs of various stakeholders. Altogether, the research in this dissertation has added to societal impact in several ways.

First, MIRA provides care professionals and managers in long-term care organizations with a shared language and structure for discussing innovation. It also gives them a collective, organized voice in managing innovation and creates space for their insights on improving innovating in daily practice (5). Furthermore, MIRA supports managers in better understanding their organization's innovation potential, thus enabling them to make strategic decisions rather than reactive ones based on outcomes. This promotes targeted learning, specific actions, and stronger collaboration (21).

Second, at the organizational level, MIRA supports care organizations in assessing their readiness to innovate. Through the questionnaire and the consensus meeting, organizations gain insights into what works well, what can be improved, and where development is needed. The long-term care organizations using MIRA reported increased knowledge of innovation readiness and requested to repeat the MIRA (25). The longitudinal tracking of MIRA results via the digital MIRA Portal may enable these organizations to monitor their readiness progress over time.

Third, beyond immediate outcomes, this research has contributed to establishing the infrastructure for managing innovation in long-term care. Impact research, conducted at six care organizations (included by the RegioPlus employer organizations) (21), featured two video testimonials highlighting the added value of MIRA. The findings demonstrated that MIRA provides care and welfare organizations with insights into their innovation maturity and a practical perspective to improve their innovation abilities; it also leads to more successful future innovations. Moreover, the impact research suggested that focusing on innovation readiness and using MIRA can support organizations' ability to adapt and innovate, thereby potentially strengthening the care and welfare sector (21, 27).

Fourth, by enabling the comparison of results across organizations, MIRA provides actionable insights into patterns and trends in long-term care. For example "Anders Werken in de Zorg" (Midden-Brabant) used MIRA to inform regional strategic planning for 2026 and inspired the "Innovatiekracht XXL" program by Health Noord, empowering care professionals in their role of innovators in their daily practice (24, 28). These insights help policymakers, educators, and networks to target their strategies and support for the sector. The MIRA Portal offers aggregated data for policy development, regional mapping, and sector-wide learning. Policymakers can incorporate MIRA into broader quality frameworks or innovation subsidies and grants, establishing structured methods to assess and support organizational innovation readiness.

Fifth, collaboration in the research (Chapter 5) resulted in a long-term partnership with the RegioPlus network, which includes 12 employer organizations across the Netherlands. They signed an intent declaration with Maastricht University's Living Lab of Ageing and Long-term Care to work as the national distributor of MIRA. They will incorporate MIRA into their professional services for care and welfare organizations. The 12 regional employer organizations of RegioPlus will support organizations with conducting the MIRA Questionnaire using the web-based MIRA Portal, and will guide the Consensus meetings, where the results are discussed and translated into concrete follow-up steps. The goal is to support these organizations in enhancing their innovation readiness and creating a lasting impact on national healthcare (29, 30).

SCIENTIFIC IMPACT

The scientific impact refers to how the research contributes to existing scientific knowledge. For example, it can improve theories, lead to publication in peer-reviewed journals, result in citations by other researchers, facilitate sharing results through presentations, or spread knowledge within the research community by other means. This dissertation has created a scientific impact in multiple ways.

Output

The dissertation has made several key contributions to scientific knowledge.

First, a widely accepted definition and a solid theoretical framework to guide improvements in innovation readiness in both research and practice had long been lacking (31-33). The dissertation contributes to expand our understanding of innovation readiness by formulating a definition of innovation readiness and an innovation readiness framework, identifying factors that contribute to innovation readiness.

Second, it introduced the Maastricht Innovation Readiness Approach (MIRA), a self-assessment method providing valuable insights into an organization's innovation readiness. MIRA combines a structured assessment (a questionnaire) with reflective learning (a consensus meeting). Feasibility testing showed that MIRA was considered acceptable, suitable, and of added value in long-term care organizations (5).

Third, MIRA introduced innovation readiness positions that define and visualize the maturity of innovation readiness in healthcare research organizations (Chapter 5, Table 2). These positions help to clarify where an organization stands, what can be improved, and how to move toward more effective innovation.

Outcome

These outputs generated several scientific outcomes. The definition, the innovation readiness framework, and MIRA might be further developed and used in future research.

First, the framework can serve as a model for (other) researchers to include innovation readiness as a research theme in their projects. Within academic circles, the innovation readiness framework has gained some attention. Among other outcomes, it has influenced healthcare research, including PhD research on reablement (34). Furthermore, through academic collaboration with Social Care in Midwifery at Maastricht University, the innovation readiness factors have been effectively extended beyond long-term care for older adults into maternity care. This resulted in a scientific article, with the author of this dissertation as the second author, demonstrating its relevance across different health sectors (35). The expansion across sectors strongly supports the framework's broader applicability. Additionally, international attention is reflected in citations from over 30 (Scopus) / 100 (Google Scholar) international researchers. For example, Lahti et al. (36) used the domains of the innovation readiness framework to develop nursing-specific innovation readiness tools, while Novikov et al. (37) created a survey to evaluate technology innovation readiness in healthcare settings. This illustrates the framework's flexibility across various healthcare professions and settings. Finally, the results of the studies in this dissertation became part of two SIA RAAK projects about innovation in long-term care (38) and rehabilitation (39), including innovation readiness as a research theme. In both projects, MIRA will serve as a predecessor in designing and evaluating a tool to support organizations in developing a strategic plan to improve innovation readiness. In the rehabilitation domain, special attention will also be given to validating the use of MIRA in rehabilitation.

Second, the concept of innovation readiness has led more researchers to further exploration. Since 2024, a national community focused on learning about innovation readiness has included members from knowledge institutions like Erasmus University, HAN University of Applied Sciences, along with trusted intermediary organizations such as employer associations (RegioPlus), regional innovation partnerships (Anders Werken in de Zorg), and the national Centre of Expertise for Long-term Care (Vilans) (40). This collaborative network provides a platform for the entire care sector to adopt and continually improve innovation readiness. It ensures that its conceptual development, guided by international research and development, remains grounded in practice while also contributing to broader scientific understanding (41).

Third, the innovation readiness framework (Chapter 5 Appendix 1) introduced in Chapter 2 is incorporated into the curricula of Maastricht University's bachelor's and master's programs, Zuyd Hogeschool's master's program, Erasmus University's

MBA, and the research master's program at Berner Fach Hochschule in Switzerland. Its integration into educational programs, both nationally and internationally, demonstrates that knowledge of innovation readiness is actively being taught to new generations of care professionals and researchers.

Fourth, with the MIRA Portal, a web application, we can collect national data on how care and welfare organizations position themselves in terms of innovation readiness maturity (Chapter 10 Appendix B: Impression of the MIRA Portal). The insights provided are at various levels (organization, regional, national, and sector-wide), highlighting organizations' strengths and areas that need attention. The MIRA Portal offers aggregated data for research, policy development, regional mapping, and sector-wide learning. Policymakers can integrate MIRA into broader quality frameworks or innovation subsidies and grants, establishing structured methods to assess and support organizational innovation readiness.

Impact

The research in this dissertation might inform and change how practice and research conceptualize and study innovation readiness in several ways.

First, efforts to increase the adoption of research findings in practice seem successful, as most organizations that have used MIRA would recommend that others try the approach (5). Additionally, the research team has been approached by participating organizations requesting that MIRA be repeated annually (11). This will be made possible through the intent declaration with RegioPlus as the national distributor of MIRA for long-term care organizations (29, 30).

Second, the concept of innovation readiness could be used to conduct in-depth research by, for example, exploring the interconnectedness of its domains. Additionally, innovation readiness has become an assessable concept that can be used to become better at innovating. This understanding is even more important when aligned with national policy priorities: the framework directly addresses a key question, "How do care organizations become 'innovation ready' for innovating with care technology?" from the Dutch national knowledge agenda (42, 43). This alignment ensures that the research contributes not only to academic discussion but also to strategic healthcare development at the national level.

Third, the innovation readiness framework encourages an organization-wide view of innovation ability by integrating four key domains: strategic direction, organization of innovation, leadership, and learning climate. This perspective supports the necessary shift from focusing solely on implementation to adopting broader strategies for innovation readiness (31).

Fourth, MIRA provides an example of measuring a multifaceted topic, such as innovation readiness, rather than seeking a single definitive answer. The innovation readiness framework and MIRA help organizations to develop their own insights. The approach not only produces research data but also builds awareness, ownership, and enhances innovation readiness as a shared ability within these care organizations (11).

Finally, longitudinal research might enable researchers to understand how innovation readiness changes over time and identify the pathways that influence it. Overall, research on innovation readiness and the use of MIRA might offer a novel approach to exploring complex organizational concepts, while also supporting organizations improve their practices.

DISSEMINATION OF FINDINGS

Throughout the research process, multiple strategies were employed to share the findings with both scientific and societal audiences. Various channels have been used to communicate the study results to long-term care organizations, researchers, policymakers, knowledge organizations, students, national stakeholders, and other relevant stakeholders.

First, of the five studies in this dissertation, four have been published in international, peer-reviewed, open-access healthcare management journals, specifically *BMC Health Services Research* (44) *BMC Geriatrics* (45), *International Journal of Research and Innovation in Social Science* (46) and *Frontiers in Health Services - Health Policy and Management* (5). One article (Chapter 6) is accepted for publication at the *Journal of the American Medical Directors Association* (25). All four published articles are open access.

Second, the findings of this dissertation research were presented at both national and international conferences on health services research, innovation, and long-term care within the scientific and professional community. These included the European Doctoral Conference on Nursing Science (2022), the annual scientific meeting of the Gerontological Society of America (2023), the European Health Management Association (2024, 2025), and the AAATE congress (2025). Additionally, the results were shared at several national conferences, such as the CaRe Days (2023), the Caphri Research Days (2023, 2024), the Verenso Spring Conference (2023), the Sano Science Days (2023, 2025), and the Living Lab for Ageing and Long-term Care Days (2024, 2025). Furthermore, innovation readiness research was shared and discussed during courses and supervision for vocational (mbo), applied sciences (hbo), and university students (bachelor's and master's) in the Netherlands and Switzerland.

Third, to further share the findings in practice, the studies in this dissertation are frequently used and presented at invited talks at venues such as ZorgEstafette (2022, 2023), ICT & Health (2024, 2025), Vilans workshops (2024, 2025), AWIZ workshops (2024, 2025), and the Healthcare Innovation School (2024). Participants in these talks included board members and innovation managers, nurses, government policy advisors, health educators, and health insurers. We also published articles in Dutch professional journals - *Geron* (47), *ICT&Health* (48), and *TVZ* (49) - as well as in *ErgoScience*, a German professional journal (3), to share the findings and implications of the studies described in Chapters 2-6.

Fourth, the channels mentioned above are primarily used to reach researchers. Therefore, to ensure that the knowledge generated by the studies is also shared with the broader practical and scientific community, additional channels have been used to disseminate the findings to society. The published papers and presentations at national

and international conferences were shared via the research team's LinkedIn accounts, the Living Lab of Ageing and Long-Term Care, and with each study's participants. The Living Lab in Ageing and Long-Term Care has a broad reach within both academic and practical networks. Furthermore, the concept of innovation readiness and MIRA are prominently featured in the Living Lab of Ageing in Long-term Care annual reports for both 2023 and 2024 (50, 51).

Finally, we made the innovation readiness framework available in an accessible A4 PDF format in Dutch, English, and German. To support the findings further, a digital factsheet on MIRA was created, covering the studies in Chapters 2-6 to illustrate and explain it. This factsheet can be downloaded as a PDF from the Living Lab of Ageing and Long-term Care website (4) (see Chapter 10 Appendix A: Brief overview of MIRA). Additionally, the collaborative network innovation readiness published MIRA online on the website of the National Centre of Expertise for Long-term Care Vilans (41).

INNOVATION READINESS IN THE FUTURE

The research findings presented in this dissertation establish a strong foundation for achieving a lasting future impact. We would like to offer several suggestions for ongoing development.

First, we recommend developing a roadmap or tool that helps organizations develop a strategic plan to understand and improve their innovation readiness. Sustainable innovation readiness involves more than just assessment and reflection - it also requires systematic, context-specific development strategies that can be tailored to various organizational settings.

Second, to create a lasting impact on innovation readiness development, it is suggested that additional research should be funded to explore specific factors and activities that further promote innovation readiness in organizations that have previously used MIRA. The principles of the Theory of Change (52, 53) might be used to understand the mechanisms behind success (or failure) in enhancing innovation readiness. This longitudinal research approach might help identify future steps, allowing the initial MIRA framework to evolve continuously based on empirical evidence. Using MIRA in approved SIA RAAK projects enables research to advance innovation readiness across various care areas, including the rehabilitation and disability care sector. These projects are more than just funding initiatives; they represent a strategic effort to expand evidence-based innovation readiness development across the entire care spectrum.

The final recommendation for the future is to expand innovation readiness more broadly across the long-term care sector. A helpful next step would be to develop a sustainable infrastructure that encourages shared learning and innovation among organizations. Scaling up MIRA nationally should be carefully monitored and supported to ensure continuity and broad reach. Data collected from the MIRA Questionnaire will feed into a national MIRA Portal and database (MEMIC), which can inform policy development and enhance regional innovation mapping, helping organizations and networks make better decisions about resources, strategic planning, and collaborative activities.

Conclusion: Impact as process and outcome

This dissertation has made a clear impact on how innovation readiness is understood and implemented in long-term care. By introducing the innovation readiness definition and framework, MIRA, the MIRA Portal, and the MIRA national database, the research has made the topic more visible, tangible, and actionable for organizations, researchers, educators, and policymakers. These results have increased awareness and motivated organizations, national partners, and the research community to actively adopt, use, and further develop innovation readiness.

This dissertation's research has made tangible contributions: organizations have started new practices, education has integrated the concepts, and researchers now include innovation readiness as a key theme. The lasting impact lies in embedding innovation readiness into organizations' strategic abilities, national healthcare infrastructure, and international research to support a sector-wide shift toward sustainable, continuous innovation.

In summary, this dissertation demonstrates how research can drive structural change: it validates innovation readiness as a concept that can be assessed and improved over time, and it provides an approach for supporting lasting improvements in long-term care.

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CHAPTER 10

Addenda

List of publications and presentations

Dankwoord

About the author

Living Lab in Ageing and Long-term Care

PhD Theses Living Lab in Ageing and Long-term care

LIST OF PUBLICATIONS AND PRESENTATIONS

International publications

Scientific articles in international journals

Van den Hoed M.W., Backhaus R, De Vries E, Hamers J.P., Daniëls R. (2022) Factors contributing to innovation readiness in healthcare organizations: a scoping review. BMC Health Services Research. 2022 Aug 5;22(1):997. DOI: 10.1186/s12913-022-08185-x.

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Submitted articles in international journals

Van den Hoed M.W., Backhaus R, De Vries E, Hamers J.P., Daniëls R. (2026. in press). Innovation readiness maturity of long-term care organizations in the Netherlands - insights from the Maastricht Innovation Readiness Approach (MIRA) – Brief report. Journal of the American Medical Directors Association.

Submitted articles in international journals (not included in this dissertation)

Hendrix M, **Van den Hoed M.W.**, Strijbosch K, Breemen M, Backhaus R. Hamers J. Daniëls R. (2025). Stakeholder perspectives on innovation readiness in maternity care in the Netherlands: a Q-methodological study. Manuscript under review 2026.

National publications

Articles

Van de Geijn T, Gregoire N, **Van den Hoed M**, Daniëls R. Tijd voor professioneel innoveren in de ouderenzorg. Gerõn. 2023;29(3). https://gerontijdschrift.nl/artikelen/tijd-voor-professioneel-innoveren-in-de-ouderenzorg/.

Van de Geijn, T. and **M. W. van den Hoed** (2024). De ouderenzorg? It Rocks! Echter waar! Jaarverslag academische werkplaats ouderenzorg Limburg 2023. Maastricht: 56-58. https://www.awolimburg.nl/nl/jaarverslag-2023.

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Van den Hoed M.W., Backhaus R, de Vries E, Hamers J.P., Daniëls R. (2024). Maastricht Innovation Readiness Aanpak - MIRA. from https://www.awolimburg.nl/userfiles/files/meetinstrumenten/2024-07-18-mira-instrument.pdf.

Conference contributions

International scientific conference contributions

Van den Hoed M.W., Backhaus R, de Vries E, Hamers J.P., Daniëls R. (2022). Factors contributing to innovation readiness in healthcare organizations: a scoping review. Oral presentation. Presented at the 19th European Doctoral Conference on Nursing Science, September 9-10, 2022, Bern, Switzerland.

Van den Hoed M.W., Backhaus R, Beaulen A, Hamers J.P., Daniëls R. (2023). Development of an evidence-based framework for innovation readiness of long-term care organizations. Poster presentation. Presented at the annual scientific meeting of the Gerontological Society of America (2023), November 9-11, 2023, Tampa, United States.

Van den Hoed, M.W., Daniëls, R, Beaulen A., Hamers J.P., van Exel J. & Backhaus R. (2024). Perspectives on managing innovation readiness in long-term care: a Q-methodology study. Oral presentation. Presented at the European Health Management Conference 2024 ‘Shaping and managing innovative health ecosystems’, September 9-11, 2024, Bucharest, Romania.

Van den Hoed M.W., Backhaus R, de Vries E, Hamers J.P., Daniëls R. (2025). The Maastricht Innovation Readiness Approach (MIRA): Added Value and Feasibility in Long-Term Care Organizations. Oral presentation. Presented at the European Health Management Conference 2025 'Taking action to improve health for all’, June 4-6, 2025, Rennes, France.

National conference contributions

Van den Hoed M.W., Backhaus R, Beaulen A, Hamers J.P., Daniëls R. Factors enabling innovation readiness of long-term care organizations: stakeholder opinions. Oral presentation. Presented at CaRe Days 'Healthy people, Healthy planet', May 10-11, 2023, Eindhoven.

Van den Hoed M.W., Backhaus R, Beaulen A, Hamers J.P., Daniëls R. Factors enabling innovation readiness of long-term care organizations: stakeholder opinions. Poster presentation. Presented at Verenso Spring Conference, June 1, 2023, Den Bosch.

Van den Hoed M.W., Backhaus R, de Vries E, Hamers J.P., Daniëls R. Factors contributing to innovation readiness in healthcare organizations: a scoping review. Poster presentation. Presented at CAPHRI Research Day 'Scientist in transition', June 7, 2023, Valkenburg.

Van den Hoed M.W., Backhaus R, Beaulen A, Hamers J.P., Daniëls R. Factors enabling innovation readiness of long-term care organizations: stakeholder opinions. Oral presentation. Presented at SANO Science Days, October 12, 2023, Amsterdam.

Van den Hoed M.W., Backhaus R, de Vries E, Hamers J.P., Daniëls R. Presentation about Maastricht Innovation Readiness Approach (MIRA) at Sano Science Days, November 4, 2024, Kerkrade.

Moritz R, Gregoire N, **Van den Hoed M.W.**, Daniëls R. Presentation and workshop: Aan de slag met innoveren: #hoe dan? (Getting innovation into practice: #how?). Symposium of the Living Lab for Ageing and Long-term Care Day, June 19, 2025, Maastricht.

Invited talks and lectures

Van den Hoed, M.W. Presentation at digital conference for directors and policymakers of long-term care organizations: Organiseren van innovatie voor de zorg van morgen (Organising innovation for the healthcare of tomorrow). https://lnkd.in/eNiz-RrG. Slimme Zorg Estafette, March 1, 2023.

Daniëls, R., **Van den Hoed, M.W.** Digital presentation for directors and policymakers of long-term care organizations: Innovation readiness, wat zegt de literatuur? (Innovation readiness: insights from the literature). Slimme ZorgEstafette, March 2, 2023.

Van den Hoed, M.W. Presentation and workshop at Masterclass Innovation Readiness (jointly organized by Master Health Innovation (MGI) (Zuyd), Master Healthcare Policy (Maastricht University), EIZT (Centre of expertise for innovative care and technology), and Living Lab in Ageing and Long-term Care Limburg), March 5, 2023, Heerlen.

Daniëls R, **Van den Hoed M.W.** Presentation and workshop at Healthcare and Education Strategy Day - Future Agile Training of Professionals. Innoveren zijn we er klaar voor? (Innovating: are we ready?). September 28, 2023, Maastricht.

Van den Hoed M.W., Prumpeler-Heijligers E. Inspirational session for educational professionals in secondary vocational education, MBO-United: In hoeverre is jouw organisatie klaar om innoverend aan de slag te gaan op het gebied van Leven Lang Leren en Ontwikkelen (LLO)? (To what extent is your organization ready to start innovating in the area of Lifelong Learning and Development (LLD)?). December 1, 2023, Houten.

Van den Hoed, M.W. Masterclass: Innoveren in de zorg (Innovating in healthcare) at Practical training day at Vivantes. Part of the Program of Zuyd University of Applied Sciences: Duaal ouderenzorg: Zorgtechnologie en Innovatie. (Dual long-term care: care technology and innovation.Beek. January 17, 2024.

Van den Hoed, M.W. Presentation and workshop at the Healthcare Innovation Lab of Maastricht Hospital UMC+ during Lunch & Learn: Factoren die bijdragen aan innovation readiness (Factors contributing to innovation readiness). February 22, 2024, Maastricht.

Daniëls R, **Van den Hoed M.W.** Online presentation at Lectoren platform Inzet van Technologie voor Gezondheid en Zorg (PIT) en workshop: Innoveren zijn we er klaar voor? March 6, 2024.

Van den Hoed, M.W. Presentation and workshop at Health Innovation School – Implementation: 'Factoren die bijdragen aan innovation readiness van zorginnovaties', November 12, 2024, Eindhoven.

Daniëls R, **Van den Hoed M.W.** Presentation and workshop at ORGfit: Innoveren zijn we er klaar voor? December 6, 2024.

Van den Hoed, M.W. presentation and workshop about Maastricht Innovation Readiness Approach (MIRA) at Masterclass Innovation Readiness (jointly organized by Master Health Innovation (MGI) (Zuyd), Master Healthcare Policy (Maastricht University), EIZT (Centre of expertise for innovative care and technology) and Living Lab in Ageing and Long-term Care Limburg), May 21, 2025, Heerlen.

Van den Hoed, M.W. Inspiration session (online) on Innovation Readiness for SPIRIT (work package professionalization and talent development) aimed at the development and growth of researchers active in the field of education and collaboration on Person-Centered Care with Integrated Technology in Healthcare, March 2, 2026.

Van den Hoed, M.W. Presentation and workshop as part of the Maastricht Innovation Readiness Approach (MIRA) during consensus meetings at 34 organizations in long-term care (n=22), disability care (n=9), and rehabilitation (n=3). 2024-2026 across the Netherlands.

ABOUT THE AUTHOR

Monique W. van den Hoed was born on September 8, 1966, in the Netherlands, and has built her career at the intersection of business, social innovation, and healthcare. She studied Business Economics at the Erasmus University Rotterdam and has held strategic and leadership roles in both the for-profit and nonprofit sectors since 1991. After serving as Director of the Chamber of Commerce in Southwest Netherlands, she transitioned to the healthcare field in 2014, where she became more involved with organizational development, innovation, and care.

Her growing interest in complex change processes led her to complete an MBA in Imagineering from Breda University of Applied Sciences in 2019, further broadening her expertise in social and organizational innovation. Besides her professional roles, she has also served as a board member in healthcare, education, and culture, including LOC Waardevolle Zorg and the Brabant International Children's Festival (BRIK).

In 2021, Monique began her PhD at Maastricht University within the Living Lab in Ageing & Long-term Care. Her research centers on innovation readiness in long-term care, exploring how long-term care organizations for older adults can improve their ability to organize and manage innovation in a sustainable and systematic way. She led the development of the Maastricht Innovation Readiness Approach (MIRA©), a multi-component approach designed to help healthcare professionals and organizations understand, assess, and improve their innovation readiness maturity. She collaborated with national partners to make innovation readiness more visible and actionable within Dutch long-term care, contributing to the development of tools, learning communities, and practical improvements.

During her PhD, Monique published on innovation readiness in healthcare organizations and presented her research findings at various national and international conferences. Within the Health Services Research department, Monique took on several educational roles in the Bachelor's and Master's programs in Health Sciences at Maastricht University, Zuyd University of Applied Sciences, Erasmus University, and Berner Fachhochschule. She also served as the PhD representative for CAPHRI - Care and Public Health Research Institute from 2021 to 2022. Among other responsibilities, she represented CAPHRI on the FHML PhD committee (FPC) and FHML at the Central PhD Candidates Platform (CPCP) of Maastricht University. In 2024, she served on the external review committee for the research evaluation of the Amsterdam Public Health Research Institute. This PhD journey was also combined with her role as Program Manager of Innovation at Watsnjoe, a collaboration of three long-term care organizations in Brabant working together on innovation.

Monique completed her PhD in 2026 and now works as a Senior Advisor for Knowledge Management at Vilans, the Dutch national center of expertise for long-term care. She also works one day a week as a researcher at Zuyd University of Applied Sciences, further developing the innovation readiness research line and supporting organizations that want to innovate in a thoughtful and sustainable way. In both roles, she stays connected to practice - something that continues to inspire her research.

LIVING LAB IN AGEING AND LONG-TERM CARE

This thesis is part of the Living Lab in Ageing and Long-term Care, a formal and structural multidisciplinary network consisting of Maastricht University, nine long-term care organizations (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Intermediate Vocational Training Institutes Gilde and VISTA college and Zuyd University of Applied Sciences, all located in the southern part of the Netherlands.

In the Living Lab we aim to improve quality of care and life for older people and quality of work for staff employed in long-term care via a structural multidisciplinary collaboration between research, policy, education and practice. Practitioners (such as nurses, physicians, psychologists, physio- and occupational therapists), work together with managers, researchers, students, teachers and older peoplethemselves to develop and test innovations in long-term care.

ACADEMISCHE WERKPLAATS OUDERENZORG LIMBURG

Dit proefschrift is onderdeel van de Academische Werkplaats Ouderenzorg Limburg, een structureel, multidisciplinair samenwerkingsverband tussen de Universiteit Maastricht, negen zorgorganisaties (MeanderGroep Zuid-Limburg, Sevagram, Envida, Cicero Zorggroep, Zuyderland, Vivantes, De Zorggroep, Land van Horne & Proteion), Gilde Zorgcollege, VISTA college en Zuyd Hogeschool.

In de werkplaats draait het om het verbeteren van de kwaliteit van leven en zorg voor ouderen en de kwaliteit van werk voor iedereen die in de ouderenzorg werkt. Zorgverleners (zoals verpleegkundigen, verzorgenden, artsen, psychologen, fysio-en ergotherapeuten), beleidsmakers, onderzoekers, studenten en ouderen zelf wisselen kennis en ervaring uit. Daarnaast evalueren we vernieuwingen in de dagelijkse zorg. Praktijk, beleid, onderzoek en onderwijs gaan hierbij hand in hand.

PHD THESES LIVING LAB IN AGEING AND LONG-TERM CARE / PROEFSCHRIFTEN ACADEMISCHE WERKPLAATS OUDERENZORG LIMBURG

Monique W. van den Hoed. Advancing innovation readiness in long-term care for older adults. 2026.
José van Dorst. Same client, different care? Investigating practice variation in home care needs assessment. 2025.
Mara Brouwers. Moving towards culture change. Insights into relocating nursing home residents with dementia to innovative living arrangements. 2025
Katharina Rosteius. To the roots: Green Care Farms as alternative nursing home setting for people living with dementia. 2025
Lise Buma. Reablement and the philosophy's goal: paving the way for reablement in the Netherlands using global insights. 2025
Niklaus S. Bernet. Fair and meaningful comparison of inpatient fall rates in acute care hospitals. 2025
Caroline Gurtner. Exploring Shared Decision Making in Swiss Acute Psychiatric Care. 2025
Coen Hacking. AI in Nursing Homes. Utilizing artificial intelligence to enhance data-analysis in long-term care for older adults. 2025
Merel van Lierop. Keep on learning! Fostering continuous learning and improvement in long-term nursing care. 2025
Johanna Rutten. Are we walking or just talking? Enhancing relationship-centered care in nursing homes. 2024
Anne G.R. Visser. Deprescribing in Nursing Home Residents: when less is more? 2024
Ines Mouchaers. Managing Everyday Life: Exploring the Essential Components of Reablement and User Experience. 2024
Lindsay Groenvynck. The transition from home to a nursing home: The perspectives and experiences of older people with dementia, informal caregivers and professional caregivers. 2024
Svenja Cremer. Undervalued & Unexplored. Underpinning and Guiding Nursing Care in Activities of Daily Living. 2024.
Katinka Pani – Harreman. The place to be. Guiding the activation of a community to facilitate ageing in place. 2024.
Vincent Moermans. Struggling with Daily Care Dilemmas. Insights in Involuntary Treatment Use among Persons Living with Dementia Receiving Professional Home Care. 2023
Chandni Khemai. There is an I in WE. Collaborative Awareness in the dedicated palliative care approach for persons with dementia. 2023.
Amal Fakha. Improving the implementation of transitional care innovations. 2023
Tom Vluggen. Towards improved multidisciplinary stroke care for older people: assessing feasibility and effectiveness of an integrated multidisciplinary geriatric rehabilitation programme for older stroke patients. 2023
Priscilla Attafuah. Quality of life, health, and social needs of slum-dwelling older adults in Ghana. 2023
Ron Warnier. Frailty screening in older hospitalized patients. 2023
Megan Davies. Tri-national ethnographic multi-case study of person-centred care and quality of life in long-term residential care. 2023
Christoph Golz. Technostress among health professionals: The blame game between health professionals and technology. 2023
Simone Paulis. Dehydration in the nursing home. Research into the prevalence, risk factors, diagnosis, roles and current collaboration between (in)formal caregivers and nursing home residents. 2023.
Sheizi Sari. Pressure injuries in Indonesian community-dwelling older adults: prevalence, prevention and treatment by the (in)formal support system. 2022.
Teuni Rooijackers. Supporting older adults to STAY ACTIVE AT HOME. Process, effect and economic evaluation of a reablement training program for homecare staff. 2022
Anne van den Bulck. Differences that matter: Understanding case-mix and quality for prospective payment of home care. 2022
Marlot Kruisbrink. Towards enhanced management of fear of falling in older people. Unravelling interventions and measuring related avoidance of activity. 2022
Ruth Vogel. Nurses in the Lead: empowering community nurse leaders to implement evidence into practice. 2022
Fabian Groven. The bed bath with or without water? It's a wash! Experiences with the washing without water intervention used for the bed bath. 2021
Roy Haex. Take a look through my eyes: The development of an experienced quality measure with clients, informal, and formal caregivers in Dutch home care. 2021

Sascha Bolt. The fundamentals of a DEDICATED palliative approach to care for people with dementia. 2021
Angela Mengelers. To risk or to restrain? Involuntary treatment use in people with dementia living at home. 2021
Katya Sion. Connecting Conversations. Experienced quality of care from the resident's perspective: a narrative method for nursing homes. 2021
Linda Hoek. Change begins with choice. Supporting the autonomy of nursing home residents with dementia through partnership. 2020
Mirre den Ouden. Every step counts. Daily activities of nursing home residents and the role of nursing staff. 2018
Theresa Thoma-Lürken. Innovating long-term care for older people. Development and evaluation of a decision support app for formal caregivers in community-based dementia care. 2018
Eveline van Velthuijsen. Caring about confusion: on the daily practice of diagnosis and management of delirium in older hospitalised patients. 2018
Bram de Boer. Living at a green care farm. An innovative alternative for regular care in nursing homes for people with dementia. 2017
Nienke Kuk. Moving forward in nursing home practice. Supporting nursing staff in implementing innovations. 2017
Irma Everink. Geriatric rehabilitation. Development, implementation and evaluation of an integrated care pathway for older patients with complex health problems. 2017
Ramona Backhaus. Thinking beyond numbers. Nursing staff and quality of care in nursing homes. 2017
Martin Van Leen. Prevention of pressure ulcers in nursing homes, a big challenge. 2017
Mariëlle Daamen-Van der Velden. Heart failure in nursing home residents. Prevalence, diagnosis and treatment. 2016
Armand Rondas. Prevalence and assessment of (infected) chronic wounds. 2016
Hanneke Beerens. Adding life to years. Quality of life of people with dementia receiving long-term care. 2016 (Cum Laude)
Donja M. Mijnarends. Sarcopenia: a rising geriatric giant. Health and economic outcomes of community-dwelling older adults with sarcopenia. 2016
Tanja Dorresteijn. A home-based program to manage concerns about falls. Feasibility, effects and costs of a cognitive behavioral approach in community-dwelling, frail older people. 2016
Basema Afram. From home towards the nursing home in dementia. Informal caregivers' perspectives on why admission happens and what they need. 2015
Noemi C. Van Nie-Visser. Malnutrition in nursing home residents in the Netherlands, Germany and Austria. Exploring and comparing influencing factors. 2014
Silke F. Metzelthin. An interdisciplinary primary care approach for frail older people. Feasability, effects and costs. 2014
Jill A.P.M. Bindels. Caring for community-dwelling frail older people: a responsive evaluation. 2014
Esther Meesterberends. Pressure ulcer care in the Netherlands versus Germany 0-1. What makes the difference? 2013
Math J.M. Gulpers. EXBELT: expelling belt restraints from psychogeriatric nursing homes. 2013
Hilde Verbeek. Redesigning dementia care. An evaluation of small-scale homelike care environments. 2011
Judith M.M. Meijers. Awareness of malnutrition in health care, the Dutch perspective. 2009
Ans I.E. Bouman. A home visiting program for older people with poor health. 2008
Monique Du Moulin. Urinary incontinence in primary care, diagnosis and interventions. 2008
Anna Huizing. Towards restraint free care for psychogeriatric nursing home residents. 2008
Pascalle Van Bilsen. Care for the elderly, an exploration of perceived needs, demands and service use. 2007
Rixt Zijlstra. Managing concerns about falls. Fear of falling and avoidance of activity in older people. 2007
Sandra Zwakhalen. Pain assessment in nursing home residents with dementia. 2007

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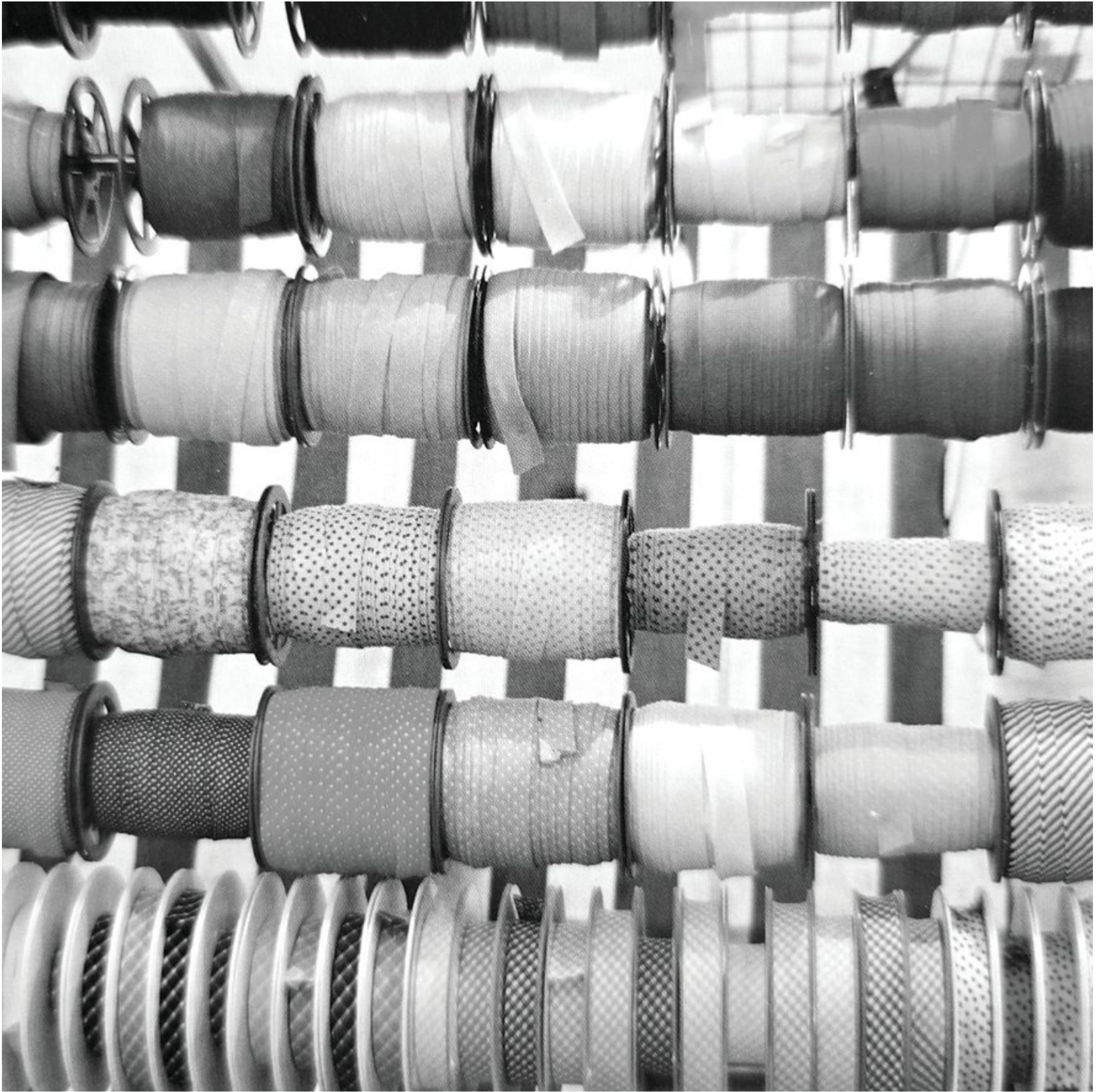
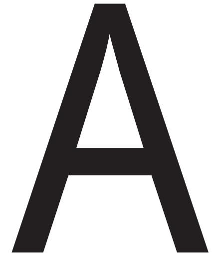


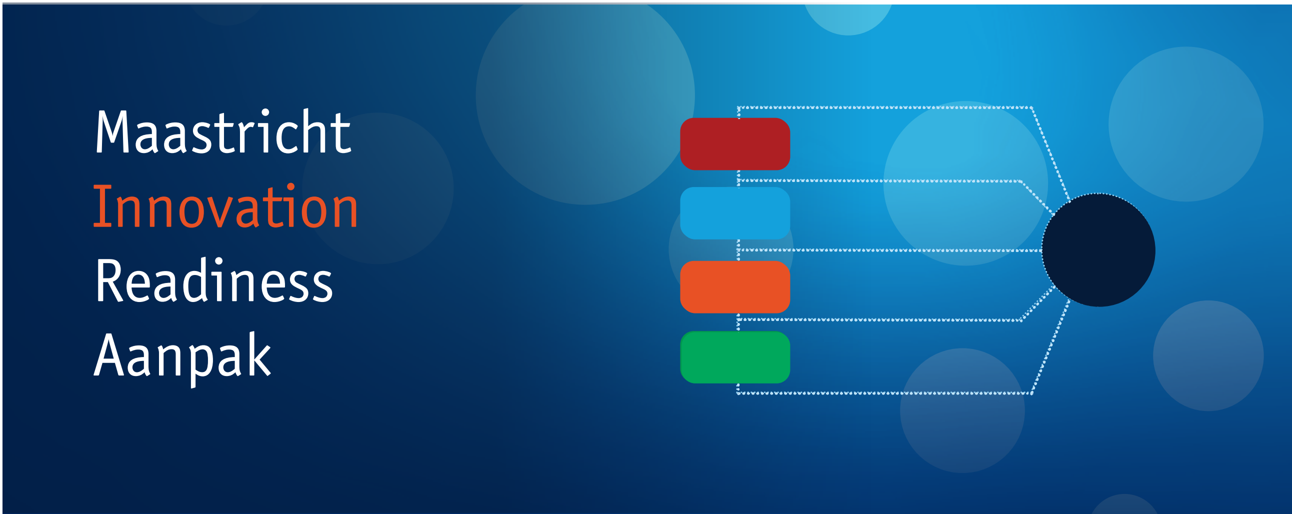
APPENDICES



A. Brief overview of MIRA
B. Impression of the MIRA-Portal

Appendix A. Brief overview of MIRA and its use (full version: Full version explanation MIRA use)

MIRA©



versie: 2 - 20 januari 2026

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MIRA©

academische
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Introductie

De Maastricht Innovation Readiness Aanpak (MIRA©) is ontwikkeld binnen de Academische Werkplaats Ouderenzorg Limburg door onderzoekers van de Universiteit Maastricht en Zuyd Hogeschool samen met vertegenwoordigers uit de praktijk.
De term 'innovation readiness' verwijst naar hoe 'klaar' een organisatie is om succesvol te innoveren onafhankelijk van het type innovatie. MIRA© ondersteunt zorgorganisaties bij reflectie op innovation readiness door:

1. Kennis aan te reiken over factoren die bijdragen aan innovation readiness;
2. De mate waarin organisaties aandacht geven aan deze factoren in kaart te brengen.

Het raamwerk van factoren en de vragenlijst van MIRA© (versie 1.0) zijn op basis van wetenschappelijk onderzoek tot stand gekomen en door experts geschikt geacht voor gebruik door ouderenzorgorganisaties. Vervolgonderzoek vindt plaats naar de toepassing van de vragenlijst in de praktijk en de geschiktheid van het raamwerk met factoren en de vragenlijst voor andere domeinen van zorg.
De meest recente versie van MIRA© is te vinden op https://www.awolimburg.nl/nl/producten/meetinstrumenten >

Meer informatie of geïnteresseerd in het inzetten van MIRA© in uw organisatie?
Mail ons dan via ouderenzorg@maastrichtuniversity.nl >

Bij gebruik van MIRA© graag vermelding van de naam: Maastricht Innovation Readiness Aanpak.

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MIRA©

Toepassing van MIRA©

Stappenplan:

1. Selecteer 10 tot 15 medewerkers, die zicht hebben op innoveren om de vragenlijst innovation readiness in te vullen (duurt ongeveer 10 minuten).
   Bij voorkeur is er onder deelnemers sprake van diversiteit qua functie en/of discipline.
2. Breng de scores van alle deelnemers in beeld in het overzicht met scores per organisatie >, en markeer factoren waar veel consensus over is, en factoren waar weinig consensus over is.
3. Organiseer een consensus-meeting met (een deel van) de deelnemers. Een aantal vragen ter inspiratie:
   - Waarom hebben we over bepaalde factoren veel overeenstemming?
   - Waarom verschillen de meningen sterk bij bepaalde factoren en kunnen we tot consensus komen?
   - Wat roept het gezamenlijke beeld uit de vragenlijst over innovation readiness bij ons op?
   - Bij de factoren waarop we minder goed scoren; wat is het gevolg van beperkte aandacht voor deze factoren?
   - Welke innovation readiness factoren mogen in de organisatie meer aandacht krijgen?

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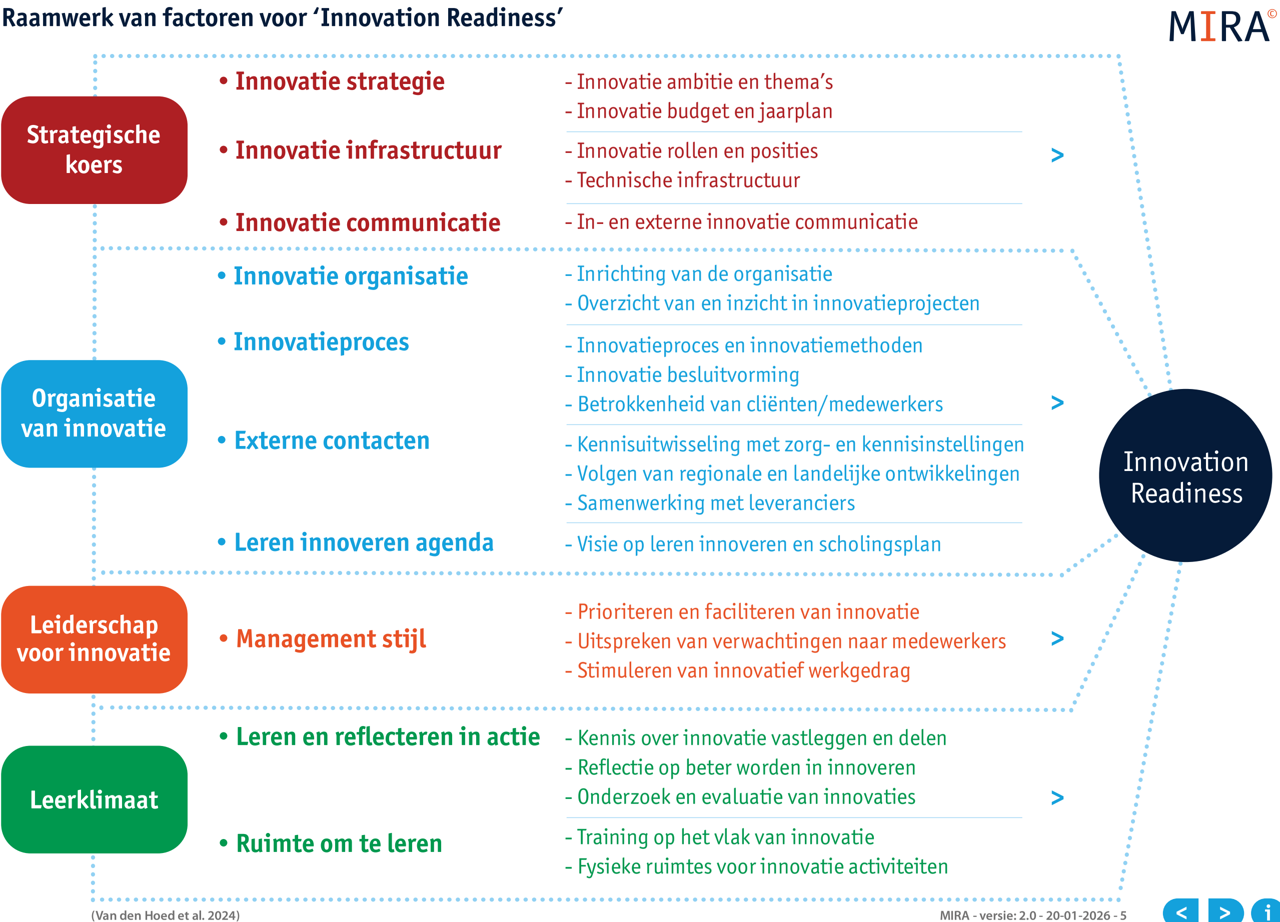

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Vragenlijst

MIRA©

Strategische koers

NIET	INFORMEEL	AF EN TOE	MEESTAL	OPTIMAAL	GEEN ZICHT OP
We doen dit niet. Hebben we geen afspraken over.	We doen dit wel. Hebben we geen afspraken over.	We doen dit af en toe. Volgens gemaakte afspraken.	We doen dit meestal. Volgens gemaakte afspraken.	We doen dit consequent. Volgens gemaakte afspraken. We leren ervan.	Ik heb er weinig zicht op. Ik kan hier geen mening over geven.

1 **In mijn organisatie richten we innovatie in op basis van onze ambitie.**
De innovatieambitie gaat o.a. over wat voor soort innovatie de organisatie nastreeft en waarom (verbeteren, vernieuwen en/of radicaal innoveren) en de ambitie daarbij (bijvoorbeeld volgend of koploper zijn).

☐ ☐ ☐ ☐ ☐ ☐

2 **Mijn organisatie zorgt ervoor dat innovatiethema's richting geven aan innovatie.**
Innovatiethema's: de gebieden waarop je met innovatie meerwaarde wilt bereiken, bijvoorbeeld duurzame inzetbaarheid van medewerkers of meer eigen regie cliënten.

☐ ☐ ☐ ☐ ☐ ☐

3 **In mijn organisatie hanteren we een jaarplan voor innovatie.**
Een innovatieplan met een budget, acties en strategieën om de innovatieambitie stap voor stap uit te voeren.

☐ ☐ ☐ ☐ ☐ ☐

4 **In mijn organisatie wordt het innovatiebudget daar waar nodig bijgesteld.**
Innovatiebudget: budget dat is bestemd voor innovatie o.a. aankoop van innovaties en tijd voor medewerkers bij innovatieprojecten.

☐ ☐ ☐ ☐ ☐ ☐

5 **Mijn organisatie heeft taken, rollen en posities specifiek voor innovatie vastgelegd.**
De organisatie beschrijft innovatietaken en -verantwoordelijkheden per functie en/of team.

☐ ☐ ☐ ☐ ☐ ☐

6 **Mijn organisatie zorgt ervoor dat de technische infrastructuur innovatie ondersteunt.**
Technische randvoorwaarden zijn zodanig op orde dat alle soorten innovaties worden ondersteund (sociaal, proces, technologisch).

☐ ☐ ☐ ☐ ☐ ☐

Appendix B. Impression of the MIRA Portal: enabling organizations to conduct the MIRA Questionnaire online, securely store data, and access real-time reporting.

Welkom bij het MIRA-Portaal!

Export

CSV	PowerPoint Consensus	PDF per vraag
Alles exporteren	Kies organisatie	Kies organisatie
Voor bepaalde organisatie		
Kies organisatie		
Voor bepaalde branche		
Kies branche		
Exporteer CSV	Exporteer PowerPoint	Exporteer PDF

Innovation readiness: organisatiescore