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The determinants of effective eHealth: high-quality applications and optimal organization: evaluating an online patient portal form a patient perspective and evaluating the quality of hybrid care from an organizational perspective
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Chapter 6

Discussion

eHealth is most effective when integrated into conventional health care in a "hybrid" health care model. In order to achieve high-quality hybrid health care, eHealth must benefit patients and must be effectively integrated and organized within regular health care.[1–3] This thesis describes the evaluation of eHealth from both a patient perspective and an organizational perspective. **Chapters 2 and 3** present patients' views of an online patient portal. **Chapters 4 and 5** describe the factors that affect the organization of high-quality hybrid health care and use these as inputs to develop a tailored quality management model and accompanying self-assessment questionnaire: the Hybrid Health Care Quality Assessment (HHQA) (**Chapter 5).** Health care organizations can use the model and questionnaire to gain insight into ways of improving the quality of their hybrid care.

In this chapter, the main findings of the research are briefly summarized and placed in a broader context, the methodological choices are discussed, and recommendations for practice and possible follow-up studies are presented. Finally, we return to the case study involving Nancy and Paul from Chapter 1 and provide examples of how the usability of the online patient portal and the quality of hybrid care might be improved.

Summary of Main Findings

Part 1. Evaluation of eHealth From a Patient Perspective: Assessment of an Online Patient Portal

Two quantitative studies investigated patients' attitudes toward a patient portal designed to communicate diagnostic test results in patient-friendly language and help patients take an active role in managing their health. Both studies found that the usability of the patient portal was rated positively, meaning that it was easy to use, considered to be trustworthy and appropriate, and provided information that was easy to understand. However, the portal only slightly contributed to self-efficacy. The items on the self-efficacy scale explored whether the patients were motivated and had the confidence to manage their health after seeing the information. A strong positive correlation was also found between the portal's usability and patients' self-efficacy, meaning that if patients found the portal easy to use, it had a positive effect on their self-efficacy. Older people, higher-educated users and patients with asthma or chronic obstructive pulmonary disease (COPD) scored the portal lower for usability, while higher-educated users also reported lower scores for self-efficacy.

It was concluded that patient portals communicating diagnostic test results in patient-friendly language appear to be usable and can help to increase the confidence of patients in managing their health. However, differentiation and personalization of the subgroups are recommended to maximize the effects of usability and self-efficacy.

Part2. Evaluation of eHealth From an Organizational Perspective: What Factors Affect the Quality of Hybrid Health Care?

In the second part, a systematic literature review and a concept mapping study were used to explore the factors involved in the effective delivery of hybrid health care. Both studies used the Donabedian SPO framework, in which structure is the health care setting and

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available resources; process is what is done in giving and receiving care; and outcomes are the end results of the health services.[4,5] According to Donabedian, the quality of care is based on these three categories and the relationships between them.

The two studies found that the quality of hybrid care is determined by organizational, technical, process-related and human factors. To translate the findings from the literature review and concept mapping study into a guide for health care organizations, a model was developed to help organizations manage hybrid health care and identify areas for improvement in order to integrate eHealth in a robust and sustainable manner. The 33 most important factors were divided into clusters, which formed the basis of a quality management model and self-assessment questionnaire named the HHQA. The model is presented visually and explained in **Chapter 6**, Figure 1 and Table 1-8. The model also visually presents the interrelationships between the factors. Using a questionnaire, the quality of each factor and cluster can be assessed to determine how effectively hybrid health care is organized. By using the questionnaire regularly, changes can also be tracked over time. A description of how the questionnaire can be used is set out in the appendix to Chapter 5.

Comparison With the Literature

Based on the results of this research, it was concluded that the quality of digital health and hybrid health care depends on the usability of eHealth itself, human factors, and how eHealth and conventional care are organized as a whole. These findings are consistent with the available evidence. The following sections discuss the main findings and compare them with the existing literature, explain the methodological choices made, and identify the strengths and weaknesses of this research.

Part1. Evaluation of eHealth From a Patient Perspective: Assessment of an Online Patient Portal

The first part of the research focused on perceived usability and self-efficacy with relation to an online patient portal communicating laboratory test results (**Chapters 2 and 3**). Other studies have found that how a portal's content is presented and how the patient interprets it affects the overall usefulness of the information, and patient satisfaction.[6–9] It is important for the information to be understandable because the online portal gives patients direct access to their medical information. The results must therefore be communicated in a way that minimizes the risk of misunderstanding. Risks may include the information causing anxiety for the patient, which can negatively affect patient health engagement.[7] Alternatively, blood test results may be misinterpreted by patients in a way that leads them to underestimate their severity.[10]

Patient characteristics such as gender, education and chronic disease status can affect portal use and perceived self-efficacy in managing their own health. [8,9,11]In this research, higher-educated users reported lower scores for usability and self-efficacy while older people and people with asthma or COPD reported lower scores for information usability (**Chapter 3**). Other studies have found that higher-educated users were more eHealth-

literate and had improved self-management after consulting health information online.[12] It is possible that the test results in the online portal were communicated too simply for higher-educated users and thus provided less of a relative advantage. [9,13–15] For older people, the lower usability could be explained by the group's digital skills.[16,17] For people with asthma or COPD, the lower usability may be explained by higher levels of anxiety, specific illness perception, age and disease severity and insufficient ability to understand health information.[18,19]

Previous research has shown that usability and perceived self-efficacy are partly influenced by the extent to which the different skills and preferences of patients are taken into account.[20] For example, eHealth applications need to be adapted for people with disabilities (e.g., those who are illiterate or have a visual or motor impairment), because otherwise digitization might increase health inequalities.[21,22] Personal preferences also need to be considered, since different people have different interests and needs.[20]

The research findings in **Chapters 3 and 4** demonstrate that patients value viewing laboratory test results online. Patients' attitudes toward an eHealth application and the extent to which it meets their needs are influenced by how the information is communicated and by personal factors such as age, disease and education. In addition, comparison with the literature reveals the need for a particular focus on personal preferences and people with disabilities. Different patient characteristics and needs must therefore be considered when developing a digital application.

Findings from various studies demonstrate that the ability to use a portal is also strongly influenced by the role of the health care professional (HCP).[9] Portals can support patient engagement and improve their health if the HCP involved has a positive belief in the portal and gives additional feedback.[9,23,24] For example, the HCP might ask whether a patient has seen the results and has any further questions.[20] The usability of the patient portal is also influenced by organizational factors, such as the use of shared decision-making, customized patient-centred care and free and adequate information flow. The implementation of a portal also interferes with workflows and culture.[20,25] Care organizations therefore need to reconsider their structure, process and outcomes in order to effectively implement eHealth. This brings us to Part Two of this thesis, which discusses the factors affecting the quality of hybrid health care.

Part 2. Evaluation of eHealth From an Organizational Perspective: What Factors Affect the Quality of Hybrid Health Care?
The systematic literature review and concept mapping study found that the successful integration of eHealth into health care is conditioned by the interplay of organizational, technical, process-related and human factors. Working with eHealth places demands on the application itself and requires consideration of patients' individual needs, a careful adjustment of human resources and the care process, and the realignment of care goals (**Chapter 4**). The challenges involved in establishing high-quality hybrid health care go beyond the type of eHealth application used, setting and treatment (**Chapters 4 and 5**).

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A nationwide survey of Dutch care providers concluded that digital transformation is both a technical and social issue.[26] The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) Framework and Consolidated Framework for Implementation Research (CFIR) show that the implementation of eHealth only succeeds when the various interacting domains (such as support from the organization, the characteristics of the technology and individual persons) are recognized and managed.[27–29] Previous studies have also shown that social aspects play a role in the integration of eHealth.[3] eHealth shifts power toward the patient and partially replaces in-person care,[30] resulting in the emergence of a patient-HCP-eHealth relationship.[31] Due to increased self-management, different approaches to patients are needed, requiring HCPs to develop new coaching communication styles and digital skills.[32] These developments require support from the management of health care organizations[3].

Several frameworks and models have been developed to support different stages of eHealth and other technical innovations.[33–35] Some commonly used examples are the CeHRes Roadmap,[36,37] the NASSS,[34] CFIR,[1,38] and Normalization Process Theory,[39,40] which complement each other well in relation to the different phases of developing a prototype, implementation, embedding and uptake. These models do not, however, include translation to redesigning care processes and preparing the organization. To improve the added value for patients and HCPs, any health care organization that introduces eHealth must be adequately prepared at the strategic, tactical and operational management levels.[41–43] The HHQA assesses all the necessary areas of focus at these three levels that determine the quality of hybrid health care.

The study of patients' attitudes toward the online portal (**Chapters 2 and 3**) is consistent with the findings of the literature review and concept mapping study (**Chapters 5 and 6**), with the usability of the technology and information provision reflected in the clusters "Quality eHealth application" and "Attentiveness to the patient". Self-efficacy corresponds to the factor "Treatment with eHealth contributes to patient self-reliance" in the "End results for the patient" cluster. Co-creation and continuous development are reflected in the "Learning system: evaluation and improvement" cluster. The factors involved in integrating eHealth effectively into health care are expressed in the "Vision, strategy, and organization", "Providing support to HCPs", and "Skills, knowledge and attitude of HCPs" clusters.

Critical Discussion of the Methodology: Strengths and Limitations

Part 1. Evaluation of eHealth From a Patient Perspective: Assessment of an Online Patient Portal

Many eHealth applications could have been evaluated, but analyzing patients' attitudes toward this particular online patient portal was interesting for several reasons. First, the study participants were patients who received a referral for a diagnostic test from their GP and viewed the online results via the patient portal on their GP's website. As most people in the Netherlands are registered with a general practice, the participants were therefore a good reflection of the Dutch population. Second, a growing number of GPs

offer patients online access to their medical records, and the laboratory results section is the most frequently consulted.[44,45] Third, in the development phase of the online patient portal, a great deal of attention was paid to how the data were communicated, with input from patients, physicians, and communications experts. Earlier scientific research was done on the communication style, following which the portal was further improved and developed.[14] As eHealth is designed to communicate personal health information and provide patients with access to their medical information,[2] it was useful to explore these aspects in relation to a high-quality patient portal. Fourth, the portal is designed to increase patients' knowledge in order to help them play an active role in the diagnostic process.[46] As eHealth is seen as a way to increase patient empowerment, there was scientific merit in exploring whether this was happening in practice.

The eHealth Impact Questionnaire (eHIQ) was selected as the most suitable instrument for evaluating the portal.[47] The eHIQ is a validated, self-reported questionnaire that measures patients' attitudes toward a specific health-related website or application. The eHIQ Information and Presentation and Motivation and Confidence to Act subscales made it possible to analyze the patients' perceptions of usability and self-efficacy as closely as possible.

The main strength of these studies is their real-world setting, with actual patients reflecting on their attitudes toward the portal. Both studies produced comparable findings regarding usability and self-efficacy, increasing the reliability of the study. Another strength is the size of the patient group and the inclusion of GP patients: since almost everyone in the Netherlands is registered with a GP practice,[48] this provided a considerable likelihood of obtaining a representative sample of Dutch society. One limitation is the fact that only a small portion of the total group that used the patient portal completed the study questionnaire. The low response rate makes it impossible to draw general conclusions about whether the way in which results are displayed and explained on the patient portal are acceptable and informative for all patients. At the time of the survey, just prior to the COVID-19 pandemic, only 2% of GP practices offered patients online access to their medical records.[44] As of 2022, however, 93% of Dutch GP practices offer online access, and eHealth has gained more attention.[44] This timing might have impacted the response rate. Using qualitative interviews with users and non-users to further explore the findings for usability and self-efficacy would be worthwhile.[49,50]

These studies were cross-sectional. They assessed whether the different variables were related to one another but were unable to investigate causality. Other personal variables may have affected the results. Other studies have shown that many determinants can play a role in how a web-based intervention is experienced, such as "fit with their daily life", technology anxiety, eHealth literacy, socioeconomic status and portal-specific factors: expectations, perceived ease of use and enjoyment.[51] Other health conditions may also have an influence, such as the severity of the disease, comorbidity or mental illness.[52] As around 90% of the patient portal users of the laboratory in our research, receive confirmation that their blood values are normal, it is plausible that these patients feel there is no need to act after seeing their results. Organizational factors might also have an impact on usability and self-efficacy. Research has shown that online portals improve

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usability and self-management more when they are integrated into health care.[1,53,54] The extent to which the online portal is effectively integrated into the everyday care of the GP practice is unknown.

Finally, this research analyzed one specific digital application, using one questionnaire, across two studies. More research is needed to evaluate usability and self-efficacy from a patient perspective. This research analyzed the goal of the concerning laboratory in questions, namely, patients having easy access to reliable data and facilitating them to play an active role in the diagnostic process. For future studies analyzing an eHealth application from a patient perspective, it would be advisable to assess patients' needs, and then select an appropriate research methodology.

Part 2. Evaluation of eHealth From an Organizational Perspective: What Factors Affect the Quality of Hybrid Health Care?

The literature review and concept mapping study used the Donabedian SPO framework in their analyses. The Donabedian framework includes all relevant aspects of an organization's structure, process and outcomes and the relationships between them and combines these aspects with health and social factors. This makes it a suitable model for evaluating the organization of hybrid health care. The Donabedian SPO framework was designed in the twentieth century, before the introduction of eHealth. For the systematic literature review, the SPO framework was adapted to the present day and to incorporate working with eHealth applications. In the concept mapping study, the SPO framework was explained to the participants during the brainstorming and sorting activities. Donabedian suggests that each category can be evaluated separately or in conjunction, and that the results will be better if the structure and process are efficient. These arguments are also reflected in the HHQA.

The literature review explored the evidence base, and the concept mapping study was used to enrich this with practical knowledge and to validate the findings. The concept mapping method made it possible to combine qualitative and quantitative data in the analyses and to present the results visually, making it ideal to develop a quality model. An accompanying self-assessment questionnaire was added to make the findings more practical and useful for health care organizations. Validating the HHQA questionnaire in follow-up studies is recommended.

The literature review included relevant studies published up to December 12, 2019, less than two weeks after the first known infection with COVID-19 (December 1, 2019).[55] As a result of the pandemic, eHealth has been scaled up rapidly, with growing experience and knowledge. Repeating the literature review two years into the pandemic might identify new factors. During the concept mapping study (March-December 2021), the new knowledge from stakeholders working in the pandemic was included. The stakeholders were direct users of eHealth and consisted of patients, HCPs and managers who determined the factors included in the model.

The strengths of these two studies are the combination and translation of knowledge from science and clinical practice into a practical model and questionnaire. Both studies

also used different research techniques. The literature review and brainstorming exercise resulted in a list of 78 unique factors, with the most important and measurable of these included in the final model. As a result, the number of factors included in the model was reduced to 33. This makes it manageable for a health care organization to use, but simplifying complexity can also become a limitation: it may mean that the model is not comprehensive, or suggest that hybrid health care quality can be improved with "quick fixes". Another limitation is that most of the data came from high-resource settings in high-income countries. In low-resource settings, care and internet facilities are different and other factors may be more important.[1,56] It would therefore be worthwhile to repeat the mapping exercise in low-resource settings.

Finally, further research is still needed to understand exactly how hybrid care can be organized optimally. The following issues require thorough evaluation. First, in the concept mapping study, it was observed that stakeholders clustered the factors differently. Second, there is still no consensus about how the quality of hybrid care should be defined.[33,37] Third, the literature review revealed that the role of the patient, health care provider, the technology used, and the health care organization need more attention in future research. Finally, the organization of hybrid health care is an emerging area of research. The HHQA provides an initial guideline for health care organizations based on systematic and scientific analysis, but further research is required.

The overarching commonality of all four studies is that the data came from real patients, HCPs and managers in real-world settings. This means that the findings are up-to-date and representative. There was also alignment across the findings, such as the impact of portal usability, individual characteristics, communication tactics and care processes on the outcome. All of these general findings are reflected in the model and questionnaire. The HHQA model and questionnaire are presented at the end of this thesis using the case study involving Nancy and Paul from Chapter 1.

Implications and Recommendations for Practice

Based on the Findings and Discussion Section of This Thesis, the Following Recommendations for Clinical Practice Are Proposed:
Invest in the Quality of eHealth Applications and Hybrid Health Care
Both the quality of eHealth applications, and their integration with conventional care, are crucial. One cannot exist without the other. Health care managers should therefore ensure that eHealth applications are high-quality and well integrated and organized within conventional health care. Improvements should also be prioritized in consultation with end-users (patients and HCPs) and other stakeholders, such as IT employees, managers and eHealth developers. In future, it will be important to consult patients that do not use eHealth or abandon its use in order to prevent inequality in the use of eHealth.

Ensure Continuous Development at all Levels of Management
The efficient and effective deployment of digital health care requires changes at the strategic, tactical, and operational levels. At the strategic level, a clear vision and policy are

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required; at the tactical level, care processes need to be redesigned; and at the operational level, HCPs require new communication, coaching and digital skills. Coordination between and within the various management levels is therefore necessary. This requires monitoring data to enable continuous feedback and adjustments between the different levels.

Clearly, this is a sizeable task. Directors, managers and HCPs all have an essential role to play. However, to manage it in an integrated way, it might be wise to establish a specific job role responsible for hybrid health care. Depending on the size of the organization, this might be at the director or manager level.

Support Patients and Health Care Professionals
Patients and HCPs need to be supported to work with digital health care. This involves the following: 1) providing hands-on support for the use of devices, training, instructions, time to learn and a 24/7 help desk; 2) redesigning the care process to contribute to patients' self-reliance and desired health outcomes, in co-creation with patients and HCPs; 3) adopting a new way of working and guiding patients with shared decision-making; and 4) supporting HCPs to change their attitudes, arranging supervision, providing training and setting aside time for these activities.

Arranging this support and the roll-out to the relevant departments could be centrally organized, and coordinated by the director or manager of hybrid health care in collaboration with the human resources department, quality managers, local managers, medical staff and patient board. For smaller organizations, a lighter governance model might be developed.

Pay Attention to Coaching Communication Styles and Digital Skills
Working with eHealth requires HCPs to develop coaching communication and digital skills. It would therefore be advisable to introduce these skills at an early stage in professional training and for professionals to work on them continuously throughout their careers via in-service training.[57,58] In a Dutch survey of the quality of GP training, 50% of students reported that there was an insufficient focus on the opportunities and targeted use of online patient access and digital consultation.[59] These skills need to be recognized and supported by health care organizations.

Use the Hybrid Health Care Quality Assessment (HHQA) as a Tool for Assessment and Improvement
The HHQA can be used as a tool to assess one disease pathway in particular, or as a guide to improve hybrid health care in general. The HHQA acts as a mirror: it reflects what needs to be done, but not how. For example, it might be used to reveal where improvements need to be made, before an organization then develops and implements an action plan. After a couple of months, the organization could check on the progress of the improvements and revise the plan where needed. The HHQA does not, however, provide an answer as to why an institution should improve its hybrid health care. The answer to that question is to be found in the strategic goals a health care organization has set for itself.[60]

Recommendations for Further Research

Based on These Findings and Considerations, the Following Recommendations for Future Research Are Proposed.
In order to develop a comprehensive understanding of the needs of HCPs in terms of engagement, daily practice and communication and coaching skills in relation to eHealth, we recommend analyzing the attitudes and needs of care providers, for example using questionnaires and semi-structured interviews.

We also recommend analyzing patients' needs, expectations and other outcomes they perceive to be of value, differentiating them further into different user groups ("users", "non-users", "rejecters" and "excluded users")[61] using interviews and focus groups.

The above suggestions might also be applied to other eHealth applications beyond the online patient portal studied to obtain an even more comprehensive picture of using eHealth from a patient and HCPs perspective.

The online patient portal was developed as part of a hybrid health care system. However, the extent of integration is unknown. It would therefore also be useful to investigate how the patient portal can be organized as part of hybrid health care with GPs, for example using the HHQA as an assessment tool. The HHQA questionnaire provides a tool for assessing whether the strategy is clear, the work processes have been well adapted, and there is good communication with the patient.

The HHQA provides a general indication of the areas for improvement in relation to the quality of hybrid health care. Using this model, a clear overview of the roles of patients, HCPs, the health care organization and the technology used can provide a basis for improvements. As the usability of the model is essential, the authors will continue with follow-up research, such as validating the HHQA in clinical practice. Questionnaires and focus groups will support an analysis of whether the HHQA can be used to assess the quality of hybrid health care, and to identify improvements to make using the HHQA as easy as possible, logical and helpful.

Other follow-up research ideas are:

- Interventional research involving the model and questionnaire: a before-after study with one-year follow-up comparing the HHQA results before and after improvement. This might be done for or by a single care institution. A comparison of the before-after measurements across several care institutions would also be interesting. The HHQA can also be used as a benchmarking tool. If necessary, it can be supplemented with qualitative group discussions to explain the differences.

- Weighting the factors based on the extent of their impact on the quality of hybrid health care in order to help organizations prioritize. This might be done using longitudinal intervention studies after the HHQA is validated.

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- Repeating the concept mapping studies in other health care environments, such as low-resource settings.[1] In low-resource settings, health care systems are set up differently at the macro, meso and organizational levels and may have different health care needs, and therefore other factors may be important for effective hybrid health care. It would therefore be valuable to repeat the concept mapping study with stakeholders in different health care environments.

- Analyzing opportunities to expand the HHQA with a toolkit, templates or manuals that enable organizations to conduct in-depth research that provides them with insight into practical improvements. We might build on several valuable toolkits that have been developed to redesign the work process from other management philosophies such as LEAN,[62] Six Sigma,[63] and Clinical Pathway.[64]

- Carrying out a process study of best and worst practices using the HHQA as an assessment tool. The lessons learned concerning each cluster and related factors can be used for health care organizations and added into the toolkit.

Conclusion

The effective and optimal organization of health care with eHealth is determined by a complex interplay of organizational, technical, process-related and human factors. Achieving high-quality hybrid health care requires consideration of patients' needs, the new patient-HCP-eHealth relationship, and a robust organizational design. Using the new quality model, HHQA, any health care organization can systematically assess the quality of its hybrid health care. Health care organizations can also use the HHQA to evaluate and identify areas for improvement in their hybrid health care to add value for patients and HCPs.

CASE STUDY

Below we provide an example of how the HHQA might be used, based on the case study of Nancy and Paul from Chapter 1. Nancy and Paul are personas based on real people. This case study illustrates the everyday experience of eHealth from the perspective of a patient and a GP. Some factors from the HHQA model have been translated into possible clinical practice situations, although not all are reflected in this case study. The model is presented visually and explained below in Figure and Table 1. For a description of how the questionnaire can be used, please see the appendix to Chapter 5.
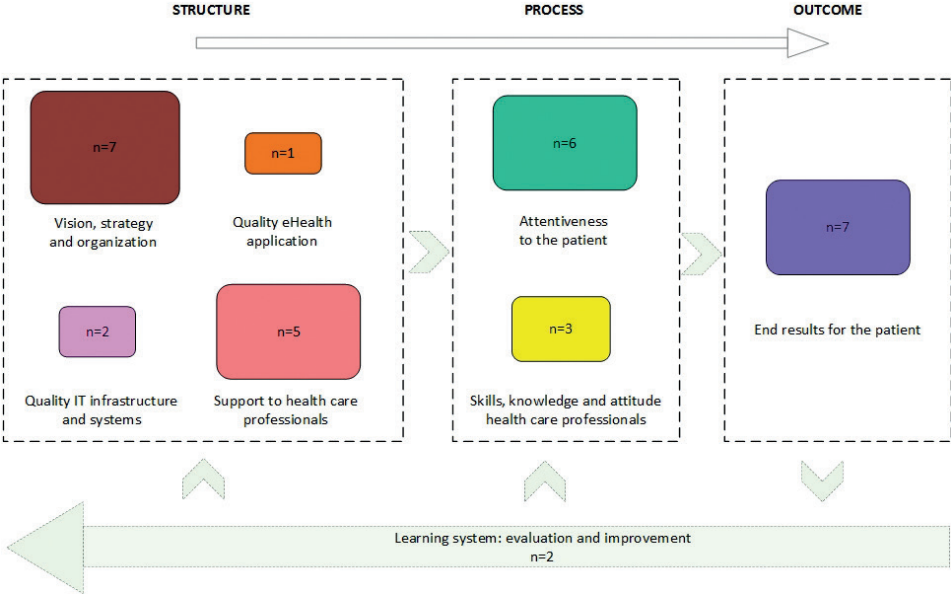

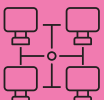**Figure 1.** The Hybrid Health Care Quality Assessment (HHQA) model

Table 1-8. Description of clusters and factors, illustrated by translation to the case study

Cluster 1. Vision, strategy, and organization

Description: Responsibilities of the health care organization concerning vision, strategy, policy, leadership, funding, and work process designs.

Factor	Possible recommendations for the case study
a. Support the implementation and development of eHealth within the organization with good project management. b. Mobilise funding for working with eHealth. c. Clear internal policies regarding the use of eHealth. d. Vision supported by the line, "Why are we doing this?" e. Care delivery with eHealth complies with laws and regulations. f. Financial reimbursement for eHealth deployment. g. Redesign the current work process and review what contributes to the desired care outcomes.	Nancy and Paul both experience the advantages of eHealth, but also see many disadvantages in the way the eHealth application is set up and organized in everyday clinical practice. As an organization, it makes sense to investigate the needs of patients, HCPs and other colleagues to form a vision of the goals of hybrid care (factor d) and determine, in co-creation with patient and HCP representatives, which process activities will ensure that the end results are met (factor g). Additionally, representatives might be involved in more depth to ensure practical implementation of the necessary activities (factors a and g).

Cluster 2. Quality IT infrastructure and systems

Description: Conditions concerning technology, information technology systems, and data.

Factors	Possible recommendations for the case study
a. IT architecture available within the health care organization. b. Back-up in case of technical problems.	Nancy and Paul's case study does not provide any information about this factor. From other research we know that the IT architecture is often set up from a technical perspective and could be more supportive of care processes with good coordination between the HCPs and the IT department.[3] A back-up also needs to be in place in case the internet fails, or logins do not work.

Cluster 3. Quality eHealth application

Description: Conditions concerning the eHealth application.

Factors	Possible recommendations for the case study
a. The eHealth application is user-friendly.	Nancy and Paul both report that the eHealth application is not completely user-friendly. It would be useful to identify the requirements of patients and GPs and to check whether the eHealth application meets these requirements and what may be needed for it to do so. This could be done in various ways, using open questions but also quantitative validated questionnaires, such as the eHIQ.

Cluster 4. Providing support to HCPs	

Description: Conditions arranged by the health care organization to encourage the use of eHealth among its health care professionals.

Factors	Possible recommendations for the case study
a. HCPs have easy access to IT resources, for example, devices, internet, screens and headsets. b. Embedding eHealth in the daily practice of HCPs. c. Training and supervision for HCPs. d. Help desk for HCPs. e. Information on treatment with eHealth is clear and accessible to the HCPs.	Clearly, eHealth is not yet embedded in Paul's everyday work (factor b): he sees patients more than before but the content of their consultations has changed, and his administrative burden has increased. There is a need to sit down with Paul and take a critical look at how his everyday work is organized and how he might work smarter (factor b). Perhaps the current provision of care is not appropriate to present circumstances, and the structure of the organization and health care process need to be reconsidered. Training and supervision may also be helpful (factor c), for example; user instructions on the online portal and improving digital skills, but also communication and coaching skills.

Cluster 5. Attentiveness to the patient	

Description: Organize the daily care process in line with the patient's needs, demand for care, and its capacity.

Factors	Possible recommendations for the case study
a. Clear communication to the patient about how care is provided. b. Personalized care, considering patient needs with regard to (deployment of) eHealth. c. The patient has easy access to the necessary IT resources, for example, device, internet, and so on. d. Patients receive practical support in using the eHealth application; for example, a help desk. e. The patient has confidence in the eHealth application. f. The patient has the flexibility to use eHealth wherever and whenever it is convenient.	The information on the portal does not provide Nancy with clear explanations, and she does not know when to contact her GP. The information for Nancy about how care is offered could be improved (factor a), but more insight into Nancy's personal needs (and those of other patients) regarding eHealth (factor b) is also necessary in order to redesign the care process to meet her personal needs. The design of the care process and eHealth application is reflected in the "Vision, strategy, and organization" cluster, and in the "Quality of eHealth application" cluster.

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Cluster 6. Skills, knowledge, and attitude of HCPs

Description: Health care professionals' ability to provide hybrid care.

Factors	Possible recommendations for the case study
a. Good balance between face-to-face and eHealth for the HCP. b. The HCP has confidence in the eHealth application. c. The HCP is satisfied with working with eHealth.	Paul has more patient consultations than before, and they discuss different things in these sessions. Even his administrative burden has increased due to digital applications. It is important to analyze potential areas for improvement, in conjunction with Paul. It may be necessary to redesign the workflows and application or to set new expectations or provide training.

Cluster 7. End results for the patient

Description: Outcomes for the patients; for example, health, added value, satisfaction, ownership, and convenience.

Factors	Possible recommendations for the case study
a. The patient can integrate the use of eHealth in their daily live. b. Treatment with eHealth has a positive influence on the patient's health. c. Treatment with eHealth contributes to the patient's self-reliance. d. The patient is satisfied. e. The patient has easy access to care. f. eHealth provides logistical convenience for the patient. g. eHealth has added value for the patient.	Nancy likes the fact that she can always consult the online patient portal and that, in combination with Paul's guidance, she has better control over her health. The ambitions of an organization in this area depend on its organizational goals. It is crucial for these factors to be checked with patients and in relation to clinical outcomes.

Cluster 8. Learning system: evaluation and improvement

Description: Evaluation and realignment with stakeholders and the patient care objectives for a continuous development.

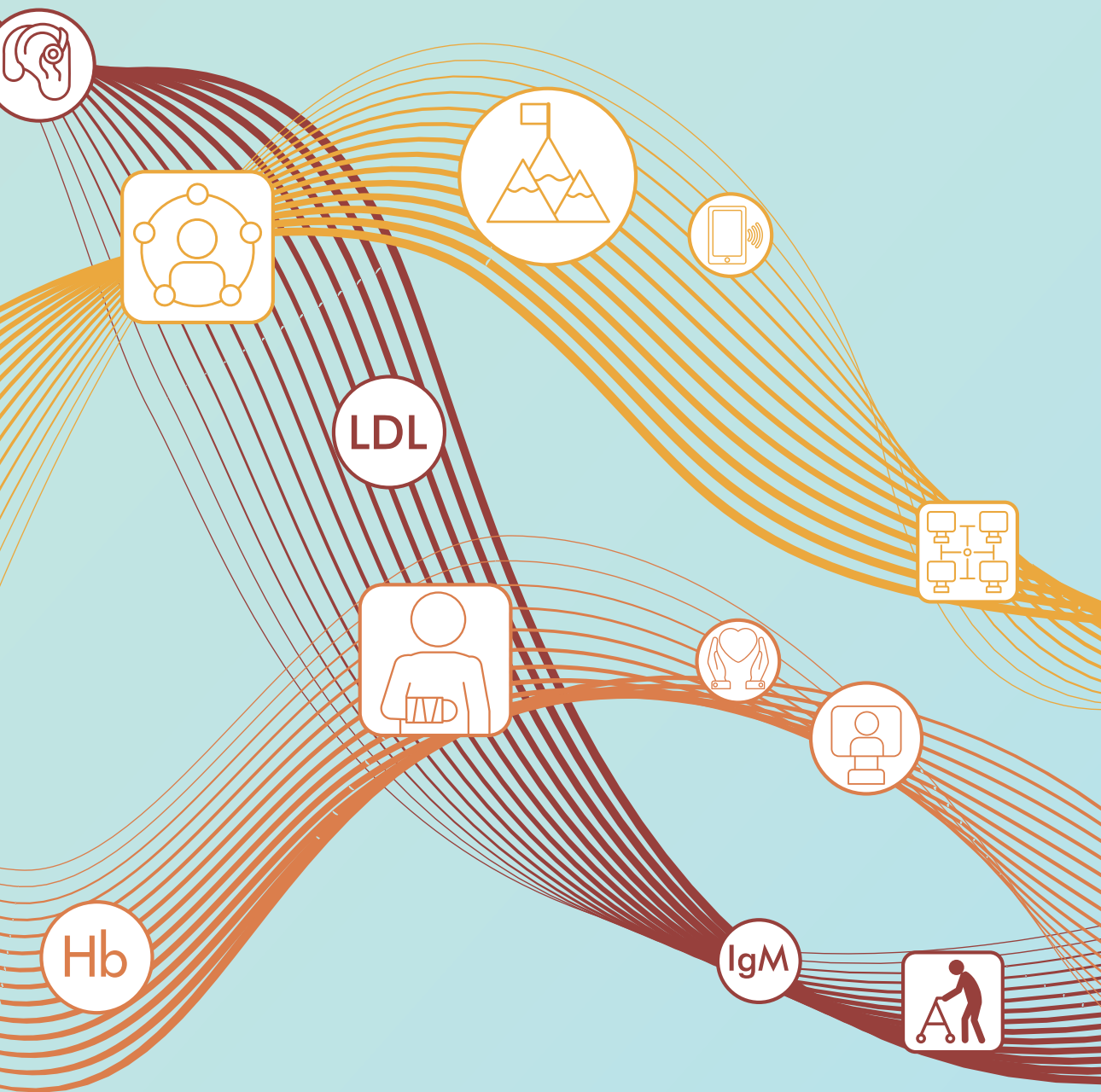| Factors	Possible recommendations for the case study
a. Co-creation: eHealth is (re)developed and implemented with different stakeholders. b. Monitoring and evaluation of service and treatment results.	Nancy has better health outcomes. However, both Nancy and Paul wish that the results of the portal were more clearly explained. Paul also finds that his administrative burden and the number of patient consultations have increased. These are inputs for improvement (factor a). After a certain period, it would be interesting to monitor the impact of the improvement on health outcomes and desired end results, such as patient and HCP satisfaction, or on other organizational criteria such as cost (factor b).

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