Research and Theory

Telehomecare technology across sectors: claims of jurisdiction and emerging controversies

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Abstract

Purpose: The purpose of this study was to explore and identify inter-organisational and inter-professional controversies that emerge when telehomecare technology is implemented across healthcare sectors.

Theory: A combined inter-organisational and inter-professional perspective constitutes the conceptual framework for this study.

Methods: The case study approach was applied as the overall methodology of the study. A triangulation of data collection techniques was used in order to provide multiple sources of evidence for exploring and identifying controversies (documents, participant observation, qualitative interviews, focus group interviews).

Findings: During the design and implementation phases of a telehomecare system, several types of controversies emerged as part of the inter-organisational and inter-professional agenda. These controversies involved competing claims of jurisdiction, controversies over knowledge technologies, or differences in network visions and network architecture.

Discussion and conclusions: The identification of such controversies and differences in the design and implementation process of the concept of home hospitalisation for heart patients by means of telehomecare technology can contribute to the uncovering of new knowledge. These issues should be taken into account when initiating a telehomecare project and implementing telehomecare technology. Technology in a network and across inter-professional relations poses a challenge to this new field. There is a particular need to precisely define the claims of jurisdiction, and the accompanying controversies that can arise related to knowledge technologies, network visions and network architecture.

Keywords

telehomecare technology, home hospitalisation, inter-organisational theory, inter-professional relations, controversies

Introduction

The development of telehomecare technology is occurring in an international context. The term 'telehomecare' denotes care and treatment cutting across sectors lines by means of information or communication technology. It is hoped that telehomecare technology can reduce the need for the readmission of the chronically ill, as well as improve integration between the primary and secondary care sectors.

Another goal of telehomecare is to enhance the quality of life for the patients who remain at home while still being monitored by healthcare professionals.

The implementation of telehomecare technologies across sectors poses a challenge not only in terms of technical aspects, but also in terms of merging work flows, coordinating tasks and the patient care process. This challenge is rooted in the implementation of telehomecare technology in an inter-organisational (network) and inter-professional landscape involving various healthcare professionals and their objectives and working culture.

There is limited research on the process of implementation of cross-sector telehomecare technology on the operational level. Studies have been carried out on the implementation processes in connection with the use of telehomecare technology in rural and remote areas [1–4]. These studies typically identify a series of barriers and opportunities when implementing telehomecare technology; overcoming these barriers is therefore a key to successful implementation [5–7]. However, this developmental approach has weaknesses, in that it gives a static picture of an implementation process in the context of an inter-organisational and inter-professional landscape. In fact, this landscape is in constant change. There is a gap in the current knowledge and existing research as to the nature and extent of problems that emerge when telehomecare technologies are implemented in the context of an inter-organisational and inter-professional landscape in the health care system.

The aim of this study was to explore and identify the inter-organisational and inter-professional controversies that occurred during the process of developing and implementing the concept of home hospitalisation for heart patients by means of telehomecare technology. This concept is in this article referred to simply as the 'home hospitalisation concept' to avoid unnecessary repetition.

Inspired by Alter and Hage [8] a 'controversy' is defined as a disagreement, disharmony, and strife about objectives, methods and policies between the healthcare professionals and organisations in a network perspective.

Conceptual framework

A combined inter-organisational and inter-professional perspective constitutes the conceptual framework for this study. Traditional organisational theories regard the world from a hierarchical perspective and therefore, have difficulties grasping inter-organisational challenges. Organisational theories tend to overlook network issues, paying attention only to the parties carrying out their respective share of the combined processes and tasks [9]. Inter-organisational theory opens up the boundaries of the organisations. An inter-professional perspective can elucidate the interactions between the actors across institutional and professional boundaries. Figure 1 illustrates the relationship between the two perspectives, hinging on telehomecare technology. Concepts and interactions are described in further detail below.
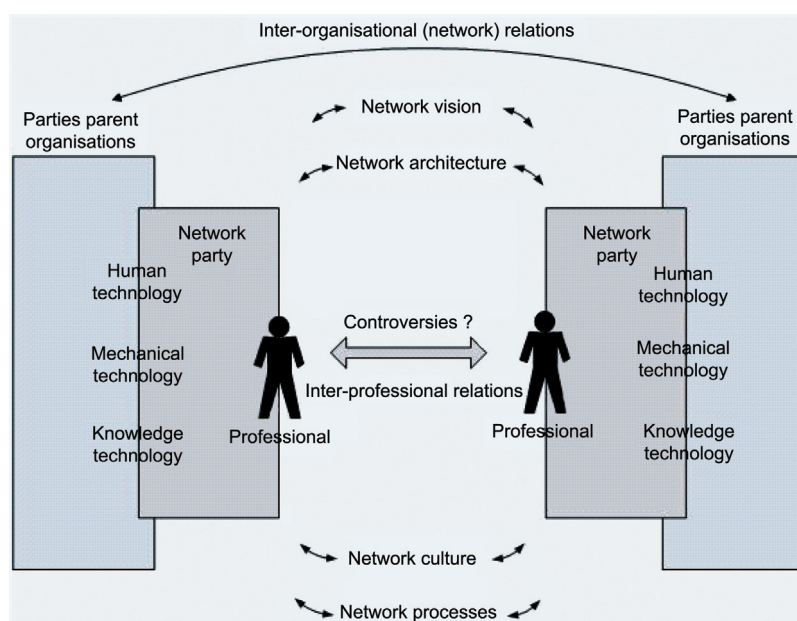

Figure 1. Conceptual framework.

In this study, the Scandinavian research tradition [10–12] serves as the basis for the inter-organisational perspective. Several of the Scandinavian researchers are inspired by Alter and Hage [8] who define a network as follows: ''Networks constitute the basic social form that permits inter-organisational interactions of exchange, converted action, and joint production. Networks are unbounded or bounded clusters of organisations that, by definition, are non-hierarchical collectives of legally separate units'' [8, p. 46]. A network consists of four main elements: parties, processes, vision and architecture [9]. Network parties are the resources of the network. The processes are centred on information exchange, coordinated action and joint problem-solving between the organisations and are determined by the situations and contexts. A network vision illustrates a mutual interest for a vision among the parties and is the picture of where the collaboration is heading. The architecture of a network is the structural framework that constitutes the form and content of collaboration.

The architecture consists of the network's legal foundation and organisational structure, e.g. its decision-making structures and authority.

In network relations, the keyword is trust. Trust between the parties is a crucial element in the relations between organisations. Network culture is multi-cultural and can be defined as the norms and values for the interaction between the parties and organisations. The culture may consist of informal rules of conduct or rules of the game in the network. Network competences are attached to the parties in the network, such as the mental models and attitudes of the parties or their knowledge and skills.

Outside the network are the parties' parent organisations (see Figure 1), illustrating relations to other networks. The term 'technology' is attached to the parties. In an organisation, technology denotes the knowledge, tools, techniques and actions used to transform input into output. Technologies appear in the processes related to the total problem-solving in the network and can be broken down into three parts [13]. Mechanical technologies refer to the physical machines, tools and equipment, e.g. the hardware of telehomecare technology. Human technologies consist of the skills and physical energy involved in producing goods or services, e.g. the clinical skills of healthcare professionals. Knowledge technologies refer to the abstract meaning and concepts used in production or service delivery, e.g. clinical procedures for taking blood samples. In this study, we address the following question: What interests and dynamics come into play between the health care professionals when a new technology is introduced?

In order to explore the interplay and dynamics between the healthcare professionals across borders, the theory of sociology of professions [14] is used in this study. This theory focuses on the system of professions, where the structure of the professionals links the profession with a task. Below the system level, Abbott investigated the differentiation within the professions themselves. Above the system level, Abbott explored the larger social forces and focused on the forces that affect the individual professions under certain conditions. The system model is based on the assumption that tasks are in constant change and constitute a process whereby the weakness of jurisdiction (the struggle about tasks and domains) is challenged. Abbott emphasises that technology can either create a jurisdiction in order to re-establish the social order or destroy a jurisdiction. Controversies over professional jurisdiction can have a variety of outcomes [14, p. 59–85]:

- *Full jurisdiction*: The profession seeks full ownership of a specific professional domain and endeavours to defend and expand this domain. This is the goal of all types of controversies among contesting professional groups.
- *Jurisdiction as subordination*: Subordination is a public and legal settlement. The subordinated groups today exist as divisions of labour evolve below the dominant professions. The controversy over jurisdiction occurs often as a result of a failed attempt among professional groups to share jurisdiction.
- *Division of labour*: There are generally clear areas of responsibility within the division of labour. A conflict typically arises when the contesting parties are forced to work together.
- *Intellectual jurisdiction*: A profession maintains control over the cognitive knowledge of a domain but allows practice on an unrestricted basis by competitors.
- *Advisory jurisdiction*: Seeks to resolve a controversy between two professions that already have full jurisdiction. ''It is a weak relation, in which one profession seeks a legitimate right to interpret, buffer, or partially modify actions another takes within its own full jurisdiction'' (p. 75). This outcome is maintained only by constant attention.

Jurisdictional controversies can take place in different arenas: the legal system, the arena of public opinion and the workplace. The conceptual framework based on inter-organisational theory and the sociology of professions will be used to explore and identify those controversies that emerge during the process of developing and implementing the home hospitalisation concept.

Study

Settings and context

The issue of professional controversies in telehome-care was explored using a case study of the cardiology ward at Vendsyssel Hospital in Frederikshavn, Denmark, and district nurses in the Municipality of Frederikshavn. The study was initiated in collaboration between the clinical partners and Aalborg University. The study focused on the development and implementation of the home hospitalisation concept and lasted from January 2005 to the end of November 2005. Included in the study were patients with heart failure, arrhythmia and patients being treated for medicine adjustment. It should be noted that the development and implementation of the home hospitalisation concept was a departure from current practice for patients, nurses and doctors at the hospital as well as district nurses and general practitioners in the communities. The project had both a design phase and an implementation phase. Overall, the study was performed according to the Helsinki declaration. Ethical approval was obtained from the local Ethics Committees.

The design phase

The initial phase lasted five months. At the start of the project, a design panel was launched in order to develop the home hospitalisation concept for heart patients. The design panel was composed of 12 members and included several health care professional groups: a head nurse, two staff nurses, three nurses, a representative of the general practitioners, three managers of district nursing communities and three district nurses. Overall, the objective of the design panel was to develop the home hospitalisation concept. This included the design of cross-sector workflows, aided by telehomecare technology: delegation and division of clinical tasks and responsibility between hospitals and district nursing, command and communication structures and an agreement on procedures for care and treatment of the heart patients as well as the dissemination of information to patients and relatives. The panel convened for six meetings, each meeting lasting two hours. These meetings provided a forum for cross-sector discussions among the health care professionals in a wider context.

The concept of home hospitalisation for heart patients

The traditional patient care process for patients with heart failure and arrhythmia and for patients being considered for medicine adjustment typically involves three to six days' admission to the cardiology ward. During the term of admission, the following procedures take place:

- Patients are continuously monitored by means of telemetry applications, 24 hours a day, in the acute phase (two days) and subsequently by means of an electrocardiogram (ECG) recording once a day.
- Anti-arrhythmia, diuretics and anticoagulation medicine are prescribed and adjusted.
- Day-to-day monitoring for blood pressure, pulse, weight and blood samples: International Normalized Ratio (INR) – measuring the blood coagulation time.
- Daily ward rounds attended by nurse and doctor between 9–11 am and at 6 pm.

At the time the patients were selected for home hospitalisation, they were typically past the acute phase of their condition and able to walk around without dyspnoea when they were transferred to admission in their own homes. The home hospitalisation of heart patients under the telehomecare system may be summed up as follows:

- District nurses visited the patients' homes in the mornings and evenings.
- By means of wireless equipment, the district nurses collected and transmitted data on blood pressure, pulse, weight, INR and ECG. The hospital staff received the ECG recordings in the hospital e-mail inbox.
- Data were transmitted to the hospital for the usual ward round attended by doctor and nurse at the hospital.
- Via a joint web-portal, the healthcare professionals at the hospital and the district nurses could enter data on blood pressure, pulse, weight, and INR for the individual patient.
- During home visits, the district nurse would telephone the hospital nurses for an exchange of information, e.g. prescription and adjustment of patient medicine.
- In the event of emergency, e.g. anxiety or complications, the patient could at any time be readmitted to hospital.
- Clinical responsibilities for the patients remained with the doctor at the hospital.

Measuring INR, recording ECG and observing heart patients in collaboration with the hospital staff represented new tasks, and indeed new areas of responsibility and competencies for the district nurses. The nurses therefore received relevant training in these areas. All the health care professionals involved in the project received training in using the joint web-portal

and its functions. The major new area of responsibility for the hospital doctors and nurses was to ensure that patients were receiving the correct treatment by the district nurses, even when they were not in the hospital.

The implementation phase

During the design phase the panel had summoned healthcare professionals to information meetings. In the implementation phase, the technical aspects of the telehomecare system were tested in a pilot project involving three patients admitted to home hospitalisation. Subsequently, the design panel convened for an evaluation meeting at which experiences and issues were debated and resolved. The problem issues included the adjustment and coordination of workflows across sectors, the comprehension of written documentation by other healthcare professionals on the joint web-portal as well as the difficulties encountered by the hospital staff in reaching the district nurses on the phone. This implementation phase lasted six months.

Methods

Case study

The case study [14] approach was applied as the overall methodology of the study. According to Yin, a case study is an empirical inquiry that: "Investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" [15, p. 13].

In view of the aim of the study, an approach is required that makes it possible *at present* to study inter-organisational and inter-professional controversies in the actual situations while these conflicts are unfolding. The study included an ongoing process analysis during the design and implementation of the home hospitalisation concept in order to identify and analyse emerging controversies. A conceptual framework based on inter-organisational and sociology of professions was applied in the case study in order to better understand the inter-organisational and inter-professional processes at work.

Action research

Action research [16–18] was part of the overall methodology as well. The deployment of action research was chosen because it facilitated an exploration of

various current topics, issues and observations in a dialogue with the participants throughout the process. At the same time, it helped to improve the design and implementation of the home hospitalisation concept. Action research was carried out when it was necessary to intervene: to facilitate organisational and technical changes through dialogue and action, or to facilitate new forms of understandings. In particular, intervention was used when discussions reached a deadlock or became too personal. To avoid bias in the use of action research, discussions were carried out with colleagues and student assistants and field notes were written prior to the intervention being carried out.

Data collection process

A triangulation of data collection techniques was used in order to provide multiple sources of evidence [15] for exploring and identifying controversies. All respondents gave their oral consent to interview participation. Interviews were tape-recorded and transcribed. The same person carried out all the transcriptions.

Design phase

Documents: In the initial phase, documents such as homepages, public reports, staff news, descriptions of task and work processes were studied in order to obtain a basic knowledge about the institutional context of the case.

Participatory observations: Participatory observations [19, 20] were conducted at meetings in the design panel through the discussions and development of the home hospitalisation concept. Participatory observations were also carried out while accompanying nurses and doctors on the cardiology ward, while accompanying the district nurses on their home visits and while attending the training of district nurses in ECG recordings and training of healthcare professionals in new technology. Observation checklists were used and field notes were taken.

Qualitative interviews: In order to explore the aim of the study, 18 qualitative interviews [21, 22] were conducted during the design phase (see Table 1). The respondents were selected for interviews based on the following criteria and ratios:

- Member of the design panel/non-members (50:50)
- Management from cardiology ward/district nursing (50:50)
- Nurse from cardiology ward/district nurses (50:50)
- Doctor from cardiology ward/general practitioners

Respondents not participating in the design panel were interviewed on the same issues to ensure that

Table 1. Survey of interviewed respondents in the design phase

Design phase	Number of interviews conducted
Nurses at hospital (from cardiology ward)	2
Nurses in the design panel (from cardiology ward)	2
Doctor in the design panel (from cardiology ward)	1
Doctor at the hospital (from cardiology ward)	1
General practitioner in the design panel	1
District nurses	2
District nurses in the design panel	2
Management of hospital in the design panel (from cardiology ward)	4
Management of district nursing in the design panel	3
Focus group interview with design panel	1
Total number of interviews carried out	19

Table 2. Survey of interviewed respondents in the implementation phase

Implementation phase	Number of interviews conducted
Nurses at hospital in the design panel (from cardiology ward)	3
Nurses at hospital (from cardiology ward)	3
Doctor in the design panel (from cardiology ward)	1
Doctor at the hospital (from cardiology ward)	1
Secretaries at the hospital (from cardiology ward)	2
District nurses in the design panel	2
District nurses	3
Management of hospital in the design panel (from cardiology ward)	4
Management of district nursing in the design panel	3
Focus group interview with nurses at hospital from the cardiology ward (4 persons not in the design panel)	1
Focus group interview with district nurses (4 persons not in the design panel)	1
Focus group interview with design panel	1
Total number of interviews carried out	25

new themes could emerge, thus facilitating a wider perspective.

The interviews were conducted as semi-structured interviews that lasted 1–1.5 hours. Interview guides were used for all interviews. The same person was responsible for planning and conducting all interviews. The schedule of interviews was adjusted to the specific issue and guided by the dynamics of the patient's condition.

Focus group interview: At the end of the design phase, a focus group interview [23] with the design panel was carried out. The purpose was to validate data collected through observations and interviews. An interview guide was used.

Implementation phase
Participatory observations: In this phase, participant observation was carried out during meetings in the design panel, with accompanying nurses and doctors on the cardiology ward, and with district nurses on home visits. Observation checklists were used and field notes were taken.

Qualitative interviews: The same procedure for conducting qualitative interviews in the design phase was used in the implementation phase. The respondents (see Table 2) were selected for interviews based on the following criteria:

- A 50/50 proportion between members of the design panel and non-members
- A 50/50 proportion between those from cardiology ward and those using district nursing

- A 50/50 proportion between nurses from the cardiology ward and district nurses
- Doctor from cardiology ward
- Other key informants (e.g. secretaries)

Focus group interviews: By the end of the implementation phase, the two focus group interviews (see Table 2) had been carried out with the nurses from the cardiology ward and the group of district nurses. Respondents for these focus group interviews were selected based on the following criteria:

- Experiences with home hospitalisation of heart patients as either cardiology ward nurses or district nurses;
- Participants in the home hospitalisation project.

The purpose of using two separate focus groups, i.e. one with nurses from the cardiology ward and one with district nurses, was to discuss different aspects of potential jurisdictional/professional controversies and to validate data from other sources. A third focus group interview was conducted with the design panel. An interview guide was used.

Data analysis

All the interviews were coded with Nvivo 2.0 software. The data were analysed using a combination of etic

and emic coding (deductive and inductive strategy). The transcribed interviews were analysed in steps inspired by Kvale [21]. A code tree was designed at start comprising nodes, descriptions/definitions of nodes and child nodes. This was done in dialogue with a research colleague. The code tree was formed on the basis of central concepts (in vitro nodes) from the conceptual frame of reference and from interviews (in vivo nodes). When formulating the concepts from the respondents, eleven qualitative interviews were studied and coded on the basis of a first-off impression. These interviews introduced three hospital nurses, three district nurses, one hospital doctor, two hospital managers and two managers of district nursing communities. Half of the interview hours took place at project start, half at project completion. The next step was a rough coding and refined coding as a result of reviews of coded material and adjustments. This step sought to identify topics and patterns, and the interpretation was widened to include a framework of understanding beyond the respondents. This phase included an in-depth interpretation held up against common-sense understanding. In this phase, the interviews were analysed with a view to inferring motivations and underlying perceptions.

The application of a computer programme for data analysis is associated with a certain bias. There are several sources of bias. First, computer coding entails a decontextualisation of the data. Second, the programme has been developed on the basis of ground theory—an inductive approach—and in this project a combined code strategy is deployed. Third, the application of the software gives the researcher a 'feeling of being distant' from the data [24].

All data collected in the two phases were validated throughout the process of the project in collaboration with research colleagues, an ongoing dialogue with healthcare professionals and through the triangulation of data sources.

Findings

Below are listed the areas of professional or jurisdictional controversies identified in the data analysis process. The areas of controversies include those connected with jurisdiction in the inter-professional relations, knowledge technologies, network visions and network architecture.

Controversies emerging during the design phase

Jurisdiction in the inter-professional relations
Competing claims of jurisdiction in the inter-professional relations were identified in the following areas:

Fear of redundancy. The nurses at the hospital felt that the district nurses threatened to take over their tasks. As one nurse complained: 'How can you put together a project that will deprive others of their livelihood? Field notes from meetings in the design panel showed that this fear prevailed in the nurses from the hospital until the first patients were admitted at home four months after project. This controversy was resolved by redefining the boundaries of intellectual jurisdiction.

Transfer of clinical tasks (ECG, blood samples) from nurses at the hospital to the district nurses. The mechanical technologies used in the concept made it possible to transfer new clinical tasks from the hospital to the district nurses. This issue was on the agenda in the discussions in the design panel at several meetings and was a central theme in the interviews. Hence, one of the nurses asked, "Do the district nurses have the qualifications for taking an ECG?" As an outcome of the discussions, an agreement was reached on a division of labour between the parties.

Shared responsibility on patient admission between hospital and district nursing in connection with the care and treatment of heart patients was another area of controversey. The resolution of this disagreement was for one group to subordinate themselves to the other: hence, the district nurses agreed that responsibility would remain with the hospital. This reflected the doubts of the hospital nurses, expressed in the question: "Are district nurses able to look after heart patients?"

Knowledge technology
Education and training of district nurses in clinical skills. The network parties were reluctant to take part in the training of district nurses to take blood samples and ECG due to disagreement concerning competencies to observe and provide patient care and treatment. In meetings of the design panel, the district nurses took pains to point out that they knew their own capabilities and did not intend to become cardiology nurses. They only wanted to take better care of the patients.

Observations also showed that the parties disagreed whether the training in taking blood samples (INR) should take place in hospital laboratories, on patient's inwards or in connection with patients visiting their GP for a medical check.

Network visions
Mental visions of other network parties are hampering the development of a vision for the telehomecare technology network. Hospital nurses and district nurses have insufficient knowledge of each other's com-

petencies and limitations and outdated images of each other. Observations showed that the parties held on to their own visions and were unable to formulate a joint vision for the patient care process by the use of telehomecare technology.

Competing visions about the patient care process for heart patients. Hospital nurses prefer to make their own home visits with the patients admitted to home hospitalisation, i.e. the vision known as 'the outgoing hospital'. District nurses want to monitor home hospitalisation patients in collaboration with the hospital staff. Observations and interview data confirm that this difference of perspective persisted throughout the design and implementations process.

Controversies emerging during the implementation phase

Network architecture
Merging clinical decision-making processes across sectors. Adjusting clinical decision-making processes across sectors was complex. Observations showed that the issues subject to discussion revolved around a fundamental respect for different contexts of work, including local work practices and workplace culture: Which party had to adjust its workflows? Who should do the adjusting?

Coordination of workflows across borders. The adjustment, prescription and administration of medicine for patients admitted to home hospitalisation involve multiple players across sectors, with the inherent greater risk of a breach of security. Typically, discussions centred on how to adjust workflows across sectors irrespective of time, place and context. The controversy was to reach consensus on coordinating workflows. Field notes report on a consensus after the first four patients had been admitted at home.

Knowledge technology
Clinical procedures across contexts. The controversy here involved a discussion of which clinical procedures—hospital-based or district nursing-based–should prevail when patients were admitted to home hospitalisation. It was eventually agreed that the district nurses should follow the hospital's clinical procedures, e.g. disinfection of patient's skin prior to taking a blood sample (INR).

Network visions
Competing visions about the patient care process for heart patients. These were the same issues as occurred in the design phase.

Discussion

The professional controversies over jurisdiction presented above are part of the inter-organisational and inter-professional agendas. They have both an intermittent and a permanent character. The key question here concerns why it is that some of these conflicts can be resolved whereas others keep re-occurring. It has not been possible to identify other studies in this field that adopt an inter-organisational and inter-professional approach to the implementation of the home hospitalisation concept.

The findings in the design phase have highlighted competing claims of professional jurisdiction among the groups of health care professionals. Issues of jurisdiction were centred on fear of redundancy, lack of mutual understanding regarding transfer of clinical tasks and shared responsibility on patient admission. From the perspective of the conceptual framework, the issues for jurisdiction occur as the healthcare professionals are placed in a field between different contexts and procedures for clinical practice and responsibility. The healthcare professionals have to navigate across the contexts and be prepared to find a new pathway in the network in order to care for the patients together with another group of professionals. Other studies show the same cross-sector jurisdiction [5, 25]. Viewed from an inter-professional perspective [15], telehomecare technology challenges professional domains and social status. Observations indicate that after trust had evolved between the parties and after negotiation took place between the health care professionals, the professional domains were reframed in the network. Other findings from the same research project showed that the concept of home hospitalisation has led toward more integrated clinical task implementation processes across sectors. The health care professionals perceive this to benefit the patients [26].

Some controversies were resolved by agreements about intellectual jurisdiction, division of labour and subordination to the final goal of the design phase. The question is whether these negotiated agreements are indicative of a development of mutual understanding that evolves over time and which creates trust between nurses and doctors from the cardiology ward and the district nurses. Action research was undertaken during the design panel meetings, and this affected the course of the discussions. Freshwater mentions that introducing new technologies in an organisation calls for action research in some situations in order to facilitate changes in social practice among the healthcare professionals [27].

When using mechanical technologies, networking parties are brought closer together in time and infrastructure. Reflecting this conceptual framework, controversies are emerging that focus on knowledge technologies when implementing the concept of telehomecare technology. This means that the knowledge technologies such as education and training and clinical procedures across sectors are forced to find a new balance to cope with the different contexts. Studies show that working with telehomecare or telemedicine produces learning, and that the parties to the network must learn new skills and competencies [28, 29].

The hospital nurses' and district nurses' images of each other caused considerable discussion. Intervention via action research was deemed necessary in order to facilitate a dialogue between these two groups. As seen in an ethnographic study, this indicates that the implementation of new technology poses a challenge to existing professional practices and relationships. New technology is more than simply an issue of being trained how to use it [30].

Controversies involving competing visions between the 'outgoing hospital' and 'home hospitalisation' occurred in both phases. Seen in an inter-organisational perspective, the healthcare professionals are again placed in a field of tension between parent organisation and the network. However, the motivations of the health care professionals can also be viewed in light of an administrative reform in Denmark whereby hospital admissions are now charged to the municipalities and relevant nursing care is to a larger extent provided by district nurses. No agreements on visions have been reached. Instead, the competing professional groups keep trying to promote their own visions and assert their own agendas. Further research is required into the ways in which competing visions affect a telehomecare network.

The clinical decision-making processes and clinical procedures are controversies related to the network architecture, as shown by Gustafsson [9]. Therefore, the home hospitalisation concept requires that health care professionals operate within a structure with which they are familiar. A study of managed clinical cardiac networks shows that clinical networks are complex because clinicians with different backgrounds and from different sectors must work together across traditional boundaries. Complex inter-organisational changes take time to develop, and improvements are likely to be slow and incremental [31]. The issue remains as to whether these controversies can be resolved with the development of the network. This issue could not be dealt with within the present study because of its limited time frame of only eleven months.

Coordination of workflows across borders appears as a point of contention in the network during the implementation phase. In the reflection of the conceptual framework, the issue revolves around which party's logic should be considered when workflows and knowledge are to be divided across sectors between the network parties. Specialised care logic confronts primary care logic, with a focus on the individual patient's social status. This kind of encounter is identified in another study [25]. The question is how the patient perceives this encounter between the two logics? Studies apparently show patient satisfaction [32] with telehomecare services, although we lack more detailed research [33].

We have identified controversies that take on different forms in the two phases of implementing telehomecare technology across sectors. The controversies in question are typically eliminated, only to re-emerge later on. Inter-organisational and inter-professional perspectives were applied to help shed new light on the process. It is not simply a question of identifying barriers to be resolved here and now, but of becoming aware of emerging points of contention, which can be resolved through dialogue and/or over time. The development of networks in a complex health care system will take time and often take an unpredictable turn as a result of the interaction between two or more contexts.

Appointing a design panel during the design phase turned out to be an effective means of identifying and overcoming potential areas of conflict prior to involving patients in the project. In terms of the implementation of telehomecare technology, this may be considered a bottom–up process. The advantage of this strategy is confirmed by a study of the conditions for success [6]. However, the question is whether the points of contention identified in the design phase would be of a different nature if the process were to be top-down. Future research is needed in order to develop telehomecare technology as a part of network processes.

Conclusions

The identification of controversies in the design and implementation process of the concept of home hospitalisation for heart patients by means of telehomecare technology contributes to the uncovering of new knowledge about issues to be taken into account when starting up a telehomecare project and implementing telehomecare technology across sectors.

Technology in a network and across inter-professional relations challenges the field and calls for claims of jurisdiction, with relating to knowledge technologies, network visions and network architecture.

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