DEVELOPING INTEGRATED CARE

Towards a Development Model for Integrated Care

Voor Zarah-Lynn en Quinn-Luuk
die mij dagelijks laten zien hoe mooi groei en ontwikkeling is

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Developing Integrated Care

Towards a development model for integrated care

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Developing Integrated Care

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Prologue

This thesis deals with the phenomenon of integrated care. Over the past decade integrating care and services has become an important development to better serve client's needs and reduce fragmentation within several health care systems. Integrated care is executed in a variety of ways and generates a substantial enthusiasm and belief in its impact by involved health care providers and policy makers all over the world. There is relatively little evidence as to what the relevant activities are when implementing integrated care and what form the development process of integrated care can take.

This thesis aims to provide further knowledge on these relevant activities or 'elements', the developmental process and quality management tools concerning integrated care. It addresses three fundamental questions as a step to further unravel the concept of integrated care:

1. What are the relevant elements of integrated care? How are these elements related to each other? What is essential for the implementation and improvement of integrated care?
2. How can the developmental process of integrated care evolve? What are the characteristics and key issues of the development process over time?
3. To what extent can this knowledge be used as a basis for a generic quality management model for integrated care? Can this model be empirically validated in integrated care practice?

In this introduction integrated care will be positioned in its international and national context. We also give an outline of our research questions. The introduction will be closed by delineating the following chapters of this thesis.

Integrated care

Many clients, in particular the chronically ill and the elderly, have needs which require the efforts of multiple health care professionals and multiple health care organisations. The role of the client, together with the best available professional knowledge and a smooth and seamless organisation of care, all contribute to the achieved quality of care. 'Integrated care' focuses on the total needs of clients, not only on the services provided by one professional or health care organisation. It is required when the services of separate and individual professionals do not cover all the demands of clients [1,2]. Integrated care appears in a variety of forms and there is no uniform and accepted definition; nor are there clear boundaries of the underlying concepts.

There is a diversity of terminologies that have variously been described as 'integrated care', 'shared care', 'disease management', 'transmural care', 'coordinated care', 'collaborative care', 'comprehensive care' or 'intermediate care'. This illustrates the polymorphous nature of the concept of integrated care that is applied from several disciplinary and professional perspectives and that is associated with diverse objectives [2-6]. Also, the definition and application of the concept of integrated care is influenced by the background and health care systems of the various authors. For instance, the definition of the World Health Organization, which is 'a concept bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion' reflects a health perspective, whereas others emphasise demedicalisation, the interdependencies of health and social care and person-centred approaches [7, 8]. From a United States perspective, Shortell referred to an Integrated Delivery System as 'a network of organizations that provides or arranges to provide a coordinated continuum of services to a defined population and is willing to be held clinically and fiscally accountable for the outcomes and the health status of the population served' [9].

Being aware of these influences, in this thesis the term integrated care is defined as:

> *'a coherent and coordinated set of services which are planned, managed and delivered to individual service users across a range of organisations and by a range of co-operating professionals and informal carers' [10].*

Integration

The integration process in healthcare is unlikely to follow a single path and variations are inevitably common. Multiple researchers and policy-makers have distinguished different dimensions of integration, with the most common taxonomies differentiating the type, breadth, degree and process of integration [3]. For types of integration, the literature differentiates functional integration, organisational integration, professional integration and clinical integration [11-13]. The breath of integration refers to the range of healthcare services provided. Horizontal integration takes place between organisations or organisational units that are on the same level of delivery of health care or have the same status; vertical integration brings together organisations at different levels or hierarchal structures like general practitioners, hospitals and nursing homes [12, 14, 15]. Some also name virtual integration, where services share information and ideas electronically [1, 11]. For the degree of integration, Leutz [16, 17] is the expert most frequently referred to and defines the three levels 'linkage', 'coordination' and 'integration'. The needs of service users define which degree of integration is needed; ranging from a more intense full integration (for users with long-term, severe, unstable conditions) to only linkage of different systems (for users with mild to moderate stable conditions, a high capacity for self-direction and routine care). Whatever the type, breadth or degree of integration aimed at, the challenge is often the implementation in practice. However, the process of integration in itself is also described as multicomponent in nature and asks for the integration of structures, processes, cultures and social relationships. It is not surprising that these challenges also ask for adjustment and new balances of the objectives, interests, power and resources of the various actors involved, making implementation even more complex [18].

Levels of integrated care

Concerning integrated care practice, multiple levels of care can be distinguished; the individual level, the organisational level, the level of the integrated care service and the level of the health care system [19]. The individual level concerns aspects like the personal routing and care of a client, adjusting care to individual needs and the transfer of information between involved professionals for one particular client. The health care organisation is often the entity to which the health care professionals formally belong, which also organise the work and administrative processes and the necessary resources. At the level of the integrated care service or care chain, the core focus is the organisation of care for a certain group of clients with (partly) comparable needs. Aspects include multidisciplinary care pathways, agreements about the roles and tasks of the involved professionals and organisations, or monitoring reports on the results at integrated care level. The level of the health care system concerns for instance the present legislation, financing systems and the professional education programmes.

The complementary levels are all important for sustainable and effective integrated care and affect and react on each other. Whereas the organisation of integrated care for a certain client group is already complex, a current important issue is also how to organise care for patients with multiple or interfering needs and morbidities. Examples are a diabetes client who is also hit by a stroke or an elderly, depressed person with rheumatoid arthritis who is suspected of dementia. These multiple morbidities require a holistic focus on the client, and also ask for new ways and models of integrated care. Worldwide experiences with intensive case management and Guided Care, which both provide for a nurse with an integral and client-focused approach, are currently being explored but much more knowledge is needed [1, 20–22]. The collaboration of multiple professionals and organisations is an important issue for integrated care; this is also key for clients with multiple morbidities.

Following Kodner [1] and Goodwin [5], the complexity of integrated care and the lack of specificity and clarity in the definition and execution of integrated care greatly hamper systematic understanding and successful, real world application. This is further complicated by the lack of a solid empirical framework. Such a framework is needed to facilitate communication, hypothesis generation, policy formulation, programme development and evaluation in the integrated care field. In this thesis we contribute to this by unravelling the concept of integrated care through focusing on the *level of the integrated care service* for a certain client group. Our study is not restricted to any specific (disease-related) client group and aims at bringing this knowledge together in an empirically-tested framework.

Relevance of integrated care

Over the past decade the integration of care has gained increasing attention from managers, health care workers, policy-makers and researchers in a large number of countries. The relevance of integrated care is related to multiple developments in health care systems in the Netherlands and around the world [10, 23, 24]. A number of these developments are:

Changing populations and preferences

The increasing number of elderly people and those with chronic illnesses requires a shift in focus from acute to chronic care [23-26]. For many patient groups the length of hospital stays have sharply declined in recent decades, necessitating early and greater involvement of (for instance) general and home care [27-28]. In addition, the majority of elderly people prefer to live at home as long as possible, making the connections between home care, prevention, social care, and palliative care more important [29, 30].

Co- and multi-morbidities

Related to these changing populations, the number of people who deal with co- and multiple morbidities is rising [23,24]. Instead of separate treatments and approaches for each disease or need, the client benefits from an integral or holistic perspective. This makes calls for cooperation and adjustment among health care specialists, workers and multiple care processes.

From supply-oriented to client-driven

Traditionally a supply-oriented approach and a dominant professional perspective have defined the care and services in many countries. The involvement of the client and his or her caregivers in the care and decision-making process and the introduction of self-management illustrate the client-driven focus, but this is not always an important perspective for professionals [31, 32].

Changing professions

An integrated focus on the client increases the need for interaction between specialists and generalists and stimulates the existence of new professions like case managers, nurse practitioners or care coordinators [5, 33]. The boundaries between intramural or extramural work are also blurring. In the Netherlands for instance doctors who traditionally worked just in nursing homes are now also are seeing patients living in the community.

Changing organisations

The characteristics of traditional health care organisations are changing. Such organisations increasingly 'integrate vertically' and offer multiple or complementary services like housing, home care, outreach care, medical and nursing care. Mergers or alliances of (smaller) health-care providers offering the same kind of services lead to 'horizontal integration' [18]. Collaboration in a diversity of networks, the development of network organisations and initiatives like shared accommodation for complementary services also enhance the need for integrated care [5].

Fragmented systems

Differing financial and legal systems in the fields of acute, chronic, social and informal care do not automatically unite and promote the needs of clients, and often make coordination and cooperation more complex. The WHO addresses this issue as 'we need to fight fragmentation' [23]. Also at system level there is a need for integrated care.

Aims of integrated care

These developments result in a need for more integrated care to reduce the existing discontinuity, duplications or absence of responsibilities for the whole continuum of care. What all definitions of integrated care do have in common is that the primary aim is to improve outcomes for the targeted population. Integrated care programmes are in this way a means and not an end in themselves and are being developed to serve multiple aims. The aims are to reduce the fragmentation and costs of care and to improve clinical outcomes, quality of life, patient satisfaction, effectiveness (using evidence-based guidelines) and efficiency [1, 4, 11, 31]. There is a widespread belief that integration of care is (at least a part of) the solution to respond to these aims and that integration will increase the results. There is a growing evidence that integrated care improves clinical and organisational outcomes, but evidence on costs are more mixed. Most outcomes are shorter term or focus on processes rather than clinical outcomes. Although the evidence is not indisputable, multiple studies on a variety of patient groups show positive effects on one or more outcome criteria [1, 3, 11, 25].

To achieve the aims of integrated care, it is important to have accurate knowledge about what the essential elements of integrated care are and how they should be implemented. Also, a good insight into the dynamics and the developmental process of local or regional integrated care practices is essential. There is however a knowledge gap concerning these topics of integrated care [24]. In the next section we will address these issues, which form important elements in this thesis.

Essential elements of integrated care

Though widely acknowledged and pursued, the implementation of integrated care has proven to be a difficult task. Health care professionals and managers struggle with the question as to which elements are essential for realising, improving, innovating and sustaining integrated care. Although much research has been done on integrated care, the studies address specific settings or patient groups and reach partly incompatible conclusions [3, 11, 34, 35]. A review of 31 disease management studies shows routine reporting and feedback loops, evidence-based guidelines, collaborative practice models and process and outcome measurement as the most frequently implemented elements. These results are based only on programmes for patients with asthma and/or diabetes mellitus [36]. Another review of integrated care programmes reports the elements of self-management support, clinical follow-up, case management, feedback and education, multidisciplinary care teams and care pathways as the most common. The results are based on mixed studies with client groups with heart failure, diabetes, rheumatoid arthritis, stroke, COPD, cardiovascular disease and general chronic illnesses [2]. Others define types of interventions like a closely-knit organisational structure, case-managed, inter-professional care with a single point of entry and the use of comprehensive service packages, an organised provider network with defined referral and service procedures, and enhanced information management and pooling of funds [1]. Overall, case management as an intervention is cited many times and would seem an important element, especially for multi-problem clients needing care for an extended period. Multiple studies also emphasise the importance of implementing mixed and multiple integrated care activities at different levels.

To conclude, the literature makes it clear that a large number of elements could be relevant for integrated care. However, there is no overview or consensus about a generic set of relevant elements for integrated care that could be used for multiple patient groups. In this thesis we therefore study implementation programmes and use a systematic literature study and a highly qualified expert panel to develop and assess a set of generic elements for integrated care. An empirical validation of such a set in practice is the necessary next step. We therefore conducted a study to validate the set of elements in three essentially different integrated care patient groups: patients with a stroke, acute myocardial infarction or dementia. Our ambition to create a generic set led to the criteria for selecting these groups. These criteria were: variation between the groups in terms of type of care (from acute to chronic); geographical spread; differences in ages or years of development; and the availability of national networks like the National Stroke Service Network that sought to encourage participation.

Integrated care implementation

A set of generic elements for integrated care would allow the implementation of integrated care to be facilitated and could provide a basis for a quality management model for integrated care. Nowadays, a number of strategies are being adopted to implement elements of integrated care. In a large number of regions in the Netherlands, there are collaborative networks of local health and social care providers, who encourage and facilitate implementation just by means of improvement projects. Often these projects are led by a coordinator and the principles of change and project management are applied. National collaborative (Breakthrough) improvement programmes have also been executed during the last decade. Examples are the Breakthrough series on stroke, diabetes, COPD, depression, interfering care and the National Dementia Programme [37, 38]. Other initiating programmes have included the National Elderly programme, the Transmural Care Programme and *In voor Zorg* [39, 40]. Under these programmes, the implementation of integrated care services was supported by the use of change management principles and by offering up to date (expert) knowledge about the disease or client group, good practices, methods of implementation and sustainability and by exchanging knowledge with others [37].

Quality management models and frameworks

Quality management models which can guide improvement processes are not frequently used in integrated care improvement projects. A quality management model is defined as a model for a structured, systematic process for creating organisation-wide participation in the planning and implementation of continuous quality improvement [41]. It is interesting to assess whether available quality management models could be useful for developing integrated care. Criteria for the selection of relevant models are: the availability of healthcare specific versions that are widely and internationally used, and assumed or proven relationships between the model components and better results in health care. According to these criteria, only the EFQM Excellence Model (European Foundation for Quality Management) and the Chronic Care Model measure up.

The EFQM Excellence model shows many parallels with the Malcolm Baldrige Quality Award criteria (MBQA) and are both widely and internationally and frequently used. Whereas the MBQA criteria consist of seven elements (leadership, strategic planning, customer and market focus, measurement, analysis and knowledge management, human resource focus, process management and results), the EFQM Excellence model consists of nine comparable elements (leadership, policy & strategy, management of people, partnership & resources and processes, key performance results, and people, customer and society results). Both models have healthcare-specific versions and are used in all types of health care organisations, regardless of sector, size or maturity. A basic premise of the models is that enablers direct and drive performance; organisations with well-developed enablers are supposed to have excellent results [42, 43]. However, these models and related models like the Model for System Change, do not have integrated care as a focus. They focus primarily on diagnosing strengths and improvement areas within organisations. Although their face validity is high, the underlying evidence for better results is marginal [44].

The Chronic Care Model (CCM) is frequently used and describes elements associated with better care outcomes for chronically ill patients. The model responds to the need for a quality improvement model that better fits with the characteristics of chronic care. The model's elements are the community, the health system, self-management support, delivery system design, decision support and clinical information systems [45, 46]. Successful implementation of the six elements may result in informed and activated patients, prepared and proactive care teams and a productive interaction between patients and care teams. The model is based on the available evidence in the literature for the effective organisation of chronic care, and is confirmed in a number of studies on chronic care. This evidence mainly addresses (multiple) components of the model like self-management support and delivery system design, leaving the evidence for the total model being scarce [3, 25, 47-50]. In the last years, a number of variants like the expanded CCM model (the Care Model), the Innovative Care for Chronic Conditions Framework and the Public Health Model for chronic conditions have been developed. Additional dimensions of these models are for instance patient safety, community policies, staff development, cultural aspects and multiple levels of care [25, 51]. Whereas the EFQM model focuses on organisations, the evidence-based CCM focuses mainly on care coordination within and across organisations in its 'health care organisation' and 'community' component. The overall model has the levels of the community, the organisation, practice and the patient as its focal point and may be conceptualised from a primary care perspective [3, 45, 46]. A range of other developed models like The Continuity of Care model, the Guided Care model, the Kaiser pyramid model, the Evercare model, Pfizer approaches, the PACE model or the Strengths model are not (yet) widely used internationally and the evidence for showing an improvement in results is at best limited [3, 25]. Although the underlying evidence for the Chronic Care Model, in particular, is growing, the CCM focuses on chronic care and not on integrated care in general.

The improvement of integrated care is complex and there is no consensus about a set of relevant elements for integrated care. Available quality management models vary in their underlying evidence and do not have integrated care as their central focus or are aimed at specific patient groups like the chronically ill. In addition, most models and studies concerning their evidence come from the USA, whereas it cannot automatically be assumed that their application would lead to equal results in, for instance, Europe [25]. The lack of a consistent set of elements and the need for a generic, evidence-based quality management model for integrated care provides an important motivation for our study.

The dynamics of integrated care

Given the number of elements to be implemented and the large number of healthcare professionals and organisations involved, the development of integrated care services is a non-linear and dynamic process. These dynamics include the integration of processes, structures and sometimes resources over time, but also topics like social relations, power, cultures and different interests [18]. The development of integrated care services never seems to be 'complete'. There are always new challenges to improve the organisation of care, improve outcomes or organise care for clients with multi-morbidities. It is therefore surprising that although the rationale for integrated care is evident, the development process to take integrated care services to higher levels over time is less clear.

There are a limited number of studies that describe developmental processes over time in integrated care settings. A study about chains of care in Sweden pointed out that professional dedication, legitimacy and confidence are important ingredients in the development process, but did not describe the process itself [52]. The development process of integrated care merely remains a black box. In this thesis we focus on developmental processes over time, within the broad spectrum of the dynamics of integrated care.

Network development

Because the available knowledge is limited, the question arises as to whether if we can use the literature in related areas like networks, network organisations or organisational development. Networks are interesting because of their diversity and dynamic features. As with integrated care services, they are continually reshaping and restructuring over time as a result of the actions and interpretations of the parties involved. A network can be defined as more or less stable patterns of social relations among different actors (people, groups, organisations) who depend on each other to reach their goals in the absence of a dominant actor [53]. However, there have been very few published reports evaluating ties and development processes in various types of network organisations in health care [54]. The available literature on health and social care networks shows that there is a variety of forms ranging from the informal to the highly structured. Goodwin describes four key types of network organisations: informal networks; co-ordinated networks; procurement networks and managed networks. These could be placed on a continuum that measures the level of organised integration, for instance that of Leutz [16]. Co-ordinated networks, defined non-contractually bounded partnerships of health-care organisations aimed at service redesign have a continuum of development on their own [5].

A review of theoretical and empirical studies about the determinants of successful network collaboration revealed that very little of the empirical work has dealt with determinants or processes of interprofessional collaboration in health [33]. D'Amour introduces a 'structuration model of collaboration' which defines ten indicators of collaboration and three levels named potential or latent collaboration, developing collaboration and active collaboration [55]. A study of network organisations in the business sector identified trust and equity as important issues in the development process. Three stages in the development process were defined: 'negotiations of joint expectations by formal bargaining and informal sense making', 'commitments for future actions' and 'execution of commitments' [56]. The stages are dynamic; they repeat and overlap one another and have a duration depending on the reliance on trust and role relationships. This raises the question as to whether levels or dynamic stages are also relevant for integrated care services.

Organisational development

In the literature about organisations a number of authors suggest that the development process of organisations can follow a predictable pattern characterised by developmental stages or life-cycle models. Most authors suggest three to five sequential stages, sometimes in parallel with natural growth stages such as birth, youth and maturity. Greiner [57] developed one of the earliest models in the private sector and defined six phases of growth, each followed by a revolution or transitional phase arising from a major organisational problem. The sixth, subsequently added phase, refers to extra-organisational solutions like alliances, networks or mergers of organisations. D'Aunno and Zuckermann [58] describe four phases for inter-organisational collaborations in health care: 'emergence of a coalition', 'transition to a federation', 'maturity of the federation' and 'critical crossroads'. For each phase they define two key factors and examples of tasks such as 'defining the goal of the coalition' in the first stage. However, empirical evidence for the model is lacking. Some point out the limits of life-cycle models. According to Phelps there is an absence of consensus about the number of phases, phase characteristics and phase definitions [59]. Moreover, the assumption that organisations do experience life cycles is based on literature that it is mainly conceptual and descriptive in nature. Studies from the latter perspective are more problem-oriented and define transitions between phases in terms of the dominant management problems to be addressed [60, 61].

Available quality management models like the EFQM/Baldrige model and the CCM differ with regard to the phases or stages of development that they recognise. The CCM defines four implementation levels, named 'A to D', in which level D describes components of the model in a limited implementation stage and level A describes the most developed stage. 'Organisational goals of chronic care' do not for example exist or are limited to one condition at level D, but are measurable, reviewed routinely and incorporated at level A. The Dutch version of the EFQM model describes five phases of organisational growth, namely 'activity-oriented', 'process-oriented', 'system-oriented' 'chain-oriented' and 'transformation-oriented'. However, the model's components in each phase are described at a generic level only and are not specified for health care.

These findings in the literature and the knowledge gap concerning integrated care development underline the importance of our study, in which we seek to unravel the dynamic development process of integrated care. If a deeper insight into these dynamics can be obtained, it could be used as part of an integral quality management model for integrated care supporting the further development of integrated care practices. In our study this is researched by consulting the literature and a highly qualified expert panel and by empirically testing the findings in multiple integrated care practices.

Research questions and outline of the thesis

Our study was designed to provide further knowledge on the essential elements, implementation and development of integrated care and to provide an empirically-tested quality-management model for integrated care. All the studies covered in this thesis have been set up to answer the research questions as steps towards unravelling the concept and development of integrated care. The thesis has been based around three dominant research questions, and seven studies have been conducted to answer these.

Research question 1: Improvement of integrated care

What is essential for the implementation and improvement of integrated care?

These studies try to determine ingredients for the implementation of integrated care practices and to learn lessons about the improvement process. To answer these questions multiple stroke and dementia cases were researched in order to determine ingredients of integrated care and their implementation process. We researched the characteristics of services, implemented changes, results and the implementation lessons. The two studies are:

1. A multiple case study of 23 stroke services, to assess the most frequently implemented ingredients of integrated stroke care, the level of improvement achieved and the lessons learned regarding the methodology and improvement process (Chapter 2).
2. A multiple case study of eight dementia services, to assess the implementation of case management programmes in integrated dementia care, the characteristics of the programmes, the effects measured and the success and failure factors of the implementation process (Chapter 3).

Research question 2: Development model for integrated care

What are the relevant ingredients of integrated care? How are these ingredients related to each other? What is the available evidence for frequently used current quality management models? How can the developmental process of integrated care evolve? What are the characteristics and key issues of the development process over time?

These studies try to explore the ingredients of a generic quality management model for integrated care and the integrated care development process. We reviewed the literature for evidence of performance improvement based on integrated quality management models and conducted a literature, Delphi, Concept Mapping and survey study to design a quality management model for integrated care. The three studies are:

1. A systematic literature review, to assess the empirical evidence for improved performance by implementing interventions in health care based on two frequently used quality management models, the EFQM Excellence Model/ MBQA criteria and the Chronic Care Model (Chapter 4).
2. A Delphi and Concept Mapping study, to identify the elements for developing integrated care and to assess how these elements can be logically grouped and labelled in order to construct a quality management model for integrated care (Chapter 5).
3. An expert panel and survey study, to identify the development process of integrated care and relate the previously identified elements to the development process of integrated care (Chapter 6).

Research question 3: Empirical validation of the Development Model for Integrated Care

To what extent can this knowledge be used as a basis for a generic quality management model for integrated care? Can this model be empirically validated in integrated care practice?

Finally we empirically validated the Development Model for Integrated Care in practice by evaluating and testing the model in 84 integrated stroke, dementia and acute myocardial infarction services. We conducted a survey study to assess:

1. The relevance, presence and implementation of the elements of the model in integrated care practice (Chapter 7).
2. The recognition of the development phases in practice, the relation between planned and implemented elements, crucial factors for the development of integrated care and the level of agreement between self-assessed and calculated phases (Chapter 8).

This thesis will end with a general conclusion, discussion of the findings and suggestions for further research, policy and practice in Chapter 9.

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Chapter 2

Integrated care for patients with a stroke in the Netherlands: results and experiences from a national Breakthrough Collaborative Improvement project

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Integrated care for patients with a stroke in the Netherlands: results and experiences from a national Breakthrough Collaborative Improvement project

Abstract

Purpose

This article considers the question if measurable improvements are achieved in the quality of care in stroke services by using a Breakthrough collaborative quality improvement model.

Context of case

Despite the availability of explicit criteria, evidence based guidelines, national protocols and examples of best practices, stroke care in the Netherlands did not improve substantially yet. For that reason a national improvement project started to improve integrated stroke care in 23 self selected stroke services.

Data sources

Characteristics of sites, teams, aims and changes were assessed by using a questionnaire and monthly self reports of teams. Progress in achieving significant quality improvement was assessed on a five point likert scale (IHI score).

Case description

The stroke services (n=23) formed multidisciplinary teams, which worked together in a collaborative based on the IHI Breakthrough Series Model. Teams received instruction in quality improvement, reviewed self reported performance data, identified bottlenecks and improvement goals, and implemented "potentially better practices" based on criteria from the Edisse study, evidence based guidelines, own ideas and expert opinion.

Conclusion and discussion

Quality of care in most participating stroke services has been improved. Eighty-seven percent of the teams improved their care significantly on at least one topic. About 34% of the teams have achieved significant improvement on all aims within the time frame of the project. The project has contributed towards further development and spread of integrated stroke care in the Netherlands.

Introduction

Stroke is a severe health care problem. In all ageing populations, stroke is a major and growing cause of death, long-term disability and health care costs [1,2]. In the Netherlands, every year 30.000 people are hit by a stroke. Ageing of the Dutch population will increase the incidence of stroke by 30% in 2015 [3]. Presently, one third of patients with a first stroke die within 36 months and about 60% survive with moderate or severe handicaps [4]. In 1999, stroke has been the third leading cause of death in the Netherlands [5] and responsible for 2.9% of its total health care costs, and for 6.0% in the population aged 75 and over. Therewith stroke ranked second on the list of most costly diseases for the elderly, after dementia [6].

Stroke services

Stroke care can be divided into three phases; acute care, rehabilitation and long term support. In the past decade, studies showed that stroke survivors, in addition to physical health effects, suffer from many psychological and social problems. A large number of disciplines and types of organisations, like hospitals, nursing homes, rehabilitation centres, general practitioners and home care providers, are involved in the provision of appropriate stroke care in the different phases. Intensive cooperation of these health care providers in a region can be the base of a 'stroke service' [7-10]. A stroke service can be defined as a network of service providers working together in an organised way to provide adequate services in all stages of the follow-up of stroke patients [11]. It requires a regional setting with all relevant institutions, working together to provide multidisciplinary, co-ordinated care through organised patient transfers and protocols.

Bottlenecks

The local implementation of the concept of stroke services varies considerably [30]. Many patients do not receive the care they require, from the appropriate professional; at the time and place they need it. In particular, many patients stay in a hospital without medical necessity, waiting for discharge to a nursing home, rehabilitation centre or waiting for professional home support or home adaptations [8, 9, 10]. When figures of average hospital length of stay of stroke patients are compared internationally, length of stay in the Netherlands is relatively long; 21 days (Australia 10 days, Canada 9 days) [12]. Other bottlenecks for providing good stroke care concern the transfer of information between professionals, the provision of evidence based treatment like thrombolysis, lack of patient information and education, availability of services in the aftercare phase and monitoring of outcomes of the care process.

Available knowledge

Given the size of the individual, societal and organisational problems, it is clear why the literature is currently paying considerable attention to the question how stroke patients may receive more effective and efficient care, especially within a better integrated care continuum [1,8,11,13-25]. Several studies have reported that integrated stroke services that embed comprehensive disease management strategies improve the quality of care and outcomes of patients [26-35].

In a prospective non-randomised controlled trial of Dutch Integrated Stroke Services (Edisse), hospitalised stroke patients in three experimental stroke service settings (N=411) were compared with concurrent patients receiving usual stroke care (N=187) in a six months follow-up. The results showed that integrating services for acute stroke may lead to organisational improvements, improved patient and professional satisfaction, higher efficiency and better patient outcomes by reducing hospital length of stay (down to 10 to 11 days) and inappropriate hospital days. The Edisse research provides a set of criteria for stroke services, to be used for optimising the quality of care and outcomes for patients with stroke and their central caregivers [26, 27].

Complex changes

Despite the availability of existing knowledge [26, 27], evidence based guidelines [20, 21], national protocols and examples of best practices stroke care in the Netherlands did not improve substantially yet. It can be argued that because of the multiple organizations and professionals involved in providing stroke care, optimal care requires a complex mix of interventions on professional, organizational and patient level aiming at coordination and integration of care [6, 30]. Referring to this complexity, the Ministry of Health commissioned a national project on implementing available knowledge to improve stroke care [36].

As a result of a national consultation among research institutes, the Institute for Healthcare Improvement CBO started in 2002 the Breakthrough Series on stroke service.

The aim of the project was to substantially improve stroke care in at least 10 stroke service regions in the Netherlands within one year and a half. The National Organization for Health Care Research and Development (ZonMw) sponsored the project. The project became the largest national improvement project on integrated care in the Netherlands, with more than 140 health care organizations involved.

Questions

This article describes the experiences and results of this national Breakthrough project on stroke services. The question to be answered is:

'Did this Breakthrough project and method contribute to improvement of integrated stroke care in the participating regions?'

- What are the characteristics of the participating stroke services and improvement teams?
- What are the most frequent improvement topics worked on and changes implemented in the stroke services?
- What is the achieved level of improvement regarding these topics and changes?
- What can be learned from applying the Breakthrough methodology to improve integrated (stroke) care?

Methodology

Participants

Before the start of the project, written descriptions of the proposed Breakthrough project and application forms to participate were posted to all Stroke Services in the Netherlands. In addition two informational meetings were organized to inform services about the overall goals and structure of the project. More than 30 stroke services applied and finally 23 participated. Seven stroke services were not accepted or withdrew because of organizational problems or funding difficulties. All 23 participants were willing to improve stroke care and did have available project management resources at the start. The first group of stroke services (n=14) started in October 2002 up till February 2004, the second group (n=9) started five months later in March 2003 up till July 2004.

Quality improvement intervention

The participating stroke services formed multidisciplinary teams which worked together to undertake a collaborative improvement effort based on the Breakthrough Series Model, as developed by the Institute for Healthcare Improvement in Boston [37]. The purpose of this model is to implement existing knowledge and examples of best practices in regular practices to improve health care and solve health care problems. During a Breakthrough Collaborative multiple (8 to 15) multidisciplinary teams work on achieving substantial improvements on a specific subject like medication safety, intensive care or stroke, in their own organization or region. During the project teams are supported by national experts on the specific topic and experts in quality improvement [37- 39].

For a more detailed description of the quality improvement intervention see Table 1.

Table 1. Elements of the quality improvement intervention

In the project the following Breakthrough elements were applied:

- *Intake procedure*
  Check on requested starting conditions (project leadership for 0,4 fte, commitment of professionals and management, financial contribution);
- *Team representing stroke service partners*
  Participation with all crucial stroke service partners, forming a multidisciplinary team (hospital, rehabilitation clinic if present, nursing homes and home care organizations);
- *Expert team*
  National expert team, led by an independent chair and consisting of neurologists, a nursing home doctor, experienced stroke project leaders, researchers, a representative from an insurance company and experts on quality improvement from CBO. The team clustered the available evidence and best practices and supported the teams during the project;
- *Preparatory work*
  Team inventory of the major bottle necks and facts and figures of the characteristics and outcomes of the current stroke service (for instance available beds and services, patient routing, length of stay);
- *Structured improvement plan*
  Improvement plan for each stroke service based on the model for improvement. Three questions of this model had to be answered. First, which aims to achieve? Second, how to measure results? And at last, which actions and changes are planned to take?
- *Rapid cycle improvement*
  Small scale testing, measuring and learning by doing, involving that a change is first tested by for instance two professionals before it gets fully implemented. The results of the test are the input to adjust the intervention (plan-do-study-act cycle);
- *Measurement and statistical process control*
  Techniques for measurement of results (such as % thrombolysis treatment, length of stay, inappropriate days), based on statistical process control. Results of small scale testing were assessed and served as input to further action and testing. Pragmatic tools for measurement were developed by the teams themselves. For length of stay measurements teams could use a prepared excel format.

- *Learning sessions*
  Four national learning sessions. The sessions focus on critical changes per topic. Also the adaptation of the improvement model, measurement techniques and findings on assessing progress are taught. Teams solidified their plans and exchanged ideas and results. Multiple project leader meetings were organized to support project leaders and discuss progress.
- *Network*
  Teams took part in a network, where information could be exchanged. A closed e-mail system (list serve), phone contact and a website with examples of documents and protocols were available.
- *Reporting progress*
  Teams reported their progress every six weeks. Progress was monitored and fed back on learning sessions and to teams individually.

Measures

To assess the impact of the Breakthrough Collaborative to the improvement of integrated stroke care we explored site characteristics as well as characteristics of aims and changes and related these characteristics on progress of improvement.

Site characteristics

Data on site characteristics involved characteristics of stroke services (size, number of stroke patients treated per year, number of health care organizations involved and complexity) and teams (size, composition). To assess stroke service characteristics all teams were asked to complete a questionnaire at the start of the project. Data on team characteristics were obtained from project documentation.

Characteristics of aims and changes

In addition data on topic and number of aims and changes implemented over the course of the collaborative by each site were examined, summarized and ranked. Data on the stroke services' aims and change activities were available from written reports that contained brief descriptions of their monthly progress on activities during the course of the collaborative.

Progress of improvement

During the project each team set measurable targets and collect data on process and outcome of care. To establish the progress in improvement, a five point likert scale from 1 (no activity yet) to 5 (outstanding progress) based on the IHI score was used. This score is a measure for the statistical significance of a change and indicates whether a change is based on normal variation or is the result of a significant improvement (see table 2). Scoring was performed by the national expert group, during the projects to monitor progress and finally and the end of both projects to establish improvements achieved (see tables). Scores are based on self reported measures of the teams concerning actual outcome measures for instance length of stay in days, percentages of thrombolysed patients or numbers of patients receiving after care. Teams reported their figures in a prepared structured format, like an excel sheet including definitions of requested measures for monitoring length of stay.

Table 2. Meaning of IHI-scores

Score	Definition
1	No activity yet (non-starter)
2	Activities implemented, no improvement yet
3	Modest improvement
4	Significant improvement
5	Outstanding progress ('best practice')

Results

Site characteristics: teams

All 23 stroke services formed a multidisciplinary improvement team with professional, management and supporting staff members. The composition of teams differed in both groups. In the first group (n=14) 64% of the teams mainly represented managers and staff. Based on this observation, stroke services of the second group (n=9) were encouraged to compose a more 'mixed' team, resulting in 6 teams (67 %) with a mix of professional and managerial representatives (29% in the first group, see table 1). During the project 32 project leaders were involved in 23 teams, due to changes in project leadership (3 times in the first group, 6 in the second group). Because of a change in project leadership, one team switched from the first to the second group. No teams dropped out.

Site characteristics: stroke services

Table 3a shows the characteristics of the stroke services. The 23 teams represented about 140 health care organisations, with an average of 6 health care organizations per stroke service region. In both groups the participating stroke services represented a mix of some larger stroke services (22 % > 250.000 inhabitants), multiple stroke services of average size (56 % between 125.000 and 250.000) and some smaller (22 % < 125.000) stroke services.

Table 3a. Characteristics of participating stroke services

Characteristic of participating stroke services	**% of regions**		
	n=14	**n=9**	**n=23**
1. Size of stroke service region			
– < 125.000 inhabitants	3	2	22%
– between 125.000 – 250.000	9	4	56%
– > 250.000 inhabitants	2	3	22%
2. Number of stroke patients per year			
– < 125 patients	2	1	13%
– between 125 - 350	8	7	65%
– > 350 patients	4	1	22%
3. Number of health care organizations			
– < 5 organisations	4	2	26%
– 5 or 6 organisations	7	3	43%
– > 6 organisations	3	2	30%
4. Complexity of the stroke services			
– > 1 hospital	1	3	17%
– > 2 nursing homes	9	4	48%
– > 2 home care organisations	4	2	26%
5. Team composition			
– mainly professional (>60%)	1	1	9%
– mix of professional and managerial/staff	4	6	43%
– mainly managerial/staff (>60%)	9	2	48%

Improvement topics

At the start of the project teams were asked to report the main bottlenecks in their current stroke care. The most frequent bottlenecks mentioned are summarized in table 3b.

Regarding these bottlenecks all teams set improvement aims on different topics, taken into account existing knowledge about effective changes [10, 11] and evidence based guidelines. Instead of free choosing any improvement topic teams in the second group were 'obliged' to work on at least four pre-specified topics: length of stay, transfer of information, thrombolysis and monitoring. Although the main improvement topics didn't differ between the first and second group, reconsidering the percentages the second group clearly followed up the obligation to work on the four pre-specified topics (table 4). Within each topic teams could work on different and multiple aims. For example, a couple of teams choosed to improve length of stay in both hospital and nursing home (one topic, two different aims). Teams set about 6 to 7 aims at average (range: 4 to 9).

Table 3b. Most frequent bottle necks

Most frequent bottlenecks mentioned	% of regions n=14	 n=9	 n=23
– Length of stay, inappropriate days	93%	100%	96%
– Inadequate transfer of information	57%	89%	70%
– Cooperation and knowledge	64%	89%	74%
– Missing after care facilities	57%	55%	56%
– No outcome monitoring	29%	55%	39%

Table 4. Overview of topics and percentage of teams working on topics

Topics	% of teams working on Total	(1st group/2nd group)
Length of stay/inappropriate days	87	(79 / 100)
Transfer of information	87	(79/ 100)
After care	56	(57 / 55)
Thrombolysis treatment	52	(36 / 78)
Protocols and cooperation	43	(57 / 22)
Monitoring and management	39	(21 / 67)
Patient education	30	(29 / 33)
Education/expertise	17	(14 / 22)

Improvement changes

Table 5 gives an overview of activities the stroke services worked on over the course of the collaborative. For example a lot of teams worked on improving the transfer of professional information between organizations. Agreements on content and timely transfer, more focus on the information needs of the receiving party, often resulted in the use of new forms or the development of a transmural patient file. The results of such changes were measured and when needed, adjusted.

The set of interventions teams used in reducing length of stay varied widely, but often focused on a proactive discharge policy, redefining admission criteria and agreements between organizations about maximum length of stay and transfer procedures. When focusing on nursing homes, more intensive rehabilitation and implementing latest guidelines were important interventions. Often rehabilitation programmes between nursing homes of the same stroke service differed enormously. The differences were discussed in the project and the teams tried to make rehabilitation programmes more uniformed. Teams also applied the simple rule to let capacity (free beds) prefer above patients preference for a specific nursing home.

Table 5. Most frequent changes per topic

Topics	**Changes tested and implemented**
Length of stay, hospital	– indication procedure (18x) – discharge criteria hospital (15x) – agreements on maximum transfer times (12x) – proactive discharge policy (9) – patients preference not leading (7x)
Length of stay, nursing homes	– uniform rehabilitation policy between nursing homes (11x) – guidelines on rehabilitation (8x) – admission criteria (6x) – reconsidering needed nursing home capacity (5x) – indication procedure (4x) – uniform multidisciplinary consultation procedure (4x)
Transfer of information	– new dossiers/forms (16x) – agreements on content (12x) – procedure of information (12x) – agreements on timeliness (11x) – allocate responsibilities (8x)
After care	– structured home visits (7x) – coordinators for after care (5x) – consults by specialised nurses in hospital (5x) – after care facilities (4x) – regular meetings for patients family (3x)
Thrombolysis	– education of nurses, paramedics, ED (12x) – protocols ED, paramedics (9x) – inform general practitioners (9x) – education neurologists (7x) – inform the public (6x)
Protocols and cooperation	– restructuring multidisciplinary consultation (6x) – checklist for cognitive screening (4x) – integration of guidelines in local protocols (3x) – standardising the treatment protocols in different organisations (3x)
Monitoring/management	– implementing registration system (11x) – allocate responsibilities (8x) – sustainability plan (8x) – monitoring policy (6x) – change of management (3x)

Table 5 (Continued)

Patient education	– protocol for patient education (7x) – folder material (4x) – checklist (4x) – professional information conversation (2x)
Professional education/Expertise	– education programmes(5x) – education policy (4x) – exchange of professionals between organisations (3x)

Progress of improvement

Teams

Teams set about 6 to 7 different improvement aims in the timeframe of the collaborative. Eighty-seven percent of the teams achieved significant improvement (score =4) on at least one improvement aim. To assess the impact of the Breakthrough Collaborative to the further development of integrated care on stroke service level we therefore choose to list the median IHI scores of the total number of aims per team (table 6). About 34% of the teams were able to show significant improvement in their self reported measures at stroke service level, whereas another 43 and 67 % showed modest improvement on all aims.

The percentage of teams, which were able to show significant improvement in the second group roughly corresponds with the percentage of teams in the first group (36 % against 33% of the teams). However, in the second project group there were no teams scoring no improvements at all, while 21% of the teams in the first group did.

Table 6. Team results in IHI scores, median score per team at the end of the project phase

IHI scores	**Number of teams**		**Number of teams**	
	(n=14)	**%**	**(n=9)**	**%**
Activity, but no improvement (<3)	3	21 %	0	0%
Modest improvement (3 - <4)	6	43%	6	67%
Significant improvement (≥ 4)	5	36%	3	33%

Topics

Table 7 gives an overview of the progress of improvement regarding the different topics. Half of the teams (42% to 50%) achieved significant improvement (IHI ≥ 4) on thrombolysis treatment and length of stay.

To illustrate the effect of these improvements in outcome measures some figures can be given. The reduction of average hospital length of stay in the participating stroke services in the forst group dropped from 19.2 days to 12.0 and in the second group from 25.1 to 12.8. On average this is a reduction of more than 40%. The percentage of thrombolysis patients in all stroke services has doubled, from an average of 2.7 to 5.4% of all hospital stroke patients. The number of hospitals, which made arrangements for thrombolysis treatment went up from 12 to 19 of 23 hospitals (43).

A high number of the teams have achieved significant improvements on the monitoring and management of their stroke service and on professional expertise (75-100%). About 75% of the teams have achieved modest to significant improvement (IHI-score of 3 or more) on the topics after care, protocols & cooperation and transfer of information. The IHI-scores also reflect that for these three topics, between 15 to 30% of the teams are still busy implementing changes. Most teams working on patient education could not show significant improvement yet (14%), but changes are still being implemented (57% IHI<3).

When comparing the first and the second project group, some remarks can be made. Taking the different topics into account, more teams in the first group were able to show significant improvements in the transfer of information and the monitoring and management of their stroke service. The second project group achieved better scores in after care and protocols and cooperation. For the length of stay, thrombolysis and professional education no specific differences between the two groups can be seen.

Table 7. Overview of percentage of teams achieving improvement per topic, (Total group n=23, 1st group (n=14) and 2nd group (n=9) in brackets)

	Total (1st group, 2nd group)		
Topics	**no improvement yet (IHI < 3)**	**modest improvement (IHI >3 en <4)**	**significant improvement (IHI > 4)**
Length of stay/inappropriate days	20 (17/22)	30 (33/22)	50 (50/56)
Transfer of information	30 (45/11)	40 (10/78)	30 (45/11)
Thrombolysis treatment	16 (0/29)	42 (60/29)	42 (40/42)
After care	15 (11/20)	54 (67/40)	31 (22/40)
Protocols and cooperation	25 (38/0)	50 (50/50)	25 (12/50)
Monitoring and management	0 (0/0)	27 (0/50)	73 (100/50)
Patient education	29 (50/0)	57 (25/100)	14 (25/0)
Education/expertise	0 (0/0)	0 (0/0)	100 (100/100)

Lessons learned and analysis of results

The Breakthrough methodology has been developed in reaction to the persistently disappointing results with standard educational methods such as lecture-style conferences which seldom result in sustainable health care improvements. Although most health care providers are highly motivated to provide the highest quality of care, a decade of experiences with improvement projects did not show a great impact in healthcare outcomes [15]. Apparently the Breakthrough method and support stimulated teams to work on improving their stroke service. Teams are working on multiple aims (average 6-7) on different topics, often spread over time. IHI scores reflect changes being made on all topics worked on.

Corresponding to the most frequent bottlenecks in the stroke services, most teams worked on topics as reducing length of stay and transfer of information. These topics reflect the typical complexity of a transmural care setting: adequate transfer of patients, information, logistics and continuity of treatment through all the steps in the care chain. Within the timeframe of the project 36% of the first and 33% of the second project group have achieved significant improvement on all aims. According to the teams, making improvements visible needs more time in a complex integrated care project.

Lessons learned

During the project lessons learned in the first project group could be used to improve the second project. In the first group teams were fully free to choose their topics for improvement. As a result of that, some teams started changes on improving after care facilities and transfer of information, neglecting patients getting the right care at the right place in earlier phases. During the project the expert team concluded that the topics length of stay, thrombolysis, transfer of information and monitoring results of stroke service are key components for good stroke care. Because of this, teams of the second group were obliged to work on those topics. Surprisingly, this more top down approach didn't get resistance from the teams. Because of the complexity of a system like a stroke service, it can be argued that focussing on essential topics is necessary and helpful in achieving results in the given time frame of a Breakthrough Collaborative. The request to focus on a limited number of topics in the second group didn't result in a less average number of aims neither.

The experience that focusing helps to improve complex care settings, could be an argument for also setting prespecified aims for teams to work on (for example an average rehabilitation period for stroke patients in nursing homes of 70 days), besides the obligation to work on four or more main topics within the subject. The available experiences with breakthrough projects in the Netherlands point out that specifying aims could be useful and help teams in complex improvement areas like integrated care. The price to pay, less influence for teams, could probably be compromised for teams by choosing the changes that fit in their context and own creative ideas to reach the aim

Summarising, the following changes in project structure were made based on lessons learned:

- The 'obligation' to work on at least length of stay, transfer of information, thrombolysis and care chain monitoring;
- More focus on mixed team composition of professionals and management;
- Additional project leaders meetings;
- Improved content of learning sessions;
- A collection of examples of documents and protocols from teams on a website;
- Earlier focus on sustainability of improvements and management of integrated stroke services;
- More frequent contact between the teams and experts.

Because the lessons learned seem to be not specific for stroke care, other integrated care project could probably benefit from them too. Although time is short and results on a topic often require changes on structure, process and outcome level as well, teams show it's possible to achieve results. The structure and used method in the project, seems to accelerate changes, movement and improvement in the participating regions.

Analysis of results

There is heterogeneity in progress of improvement within the two groups and between topics. This is not surprising, however, given the multitude of factors that contribute to a successful quality improvement intervention. In line with the existing literature and evidence [40-42], the mixed effects can be attributed to differences in organizational context of the stroke services, differences in team characteristics, the ability to implement changes or available resources.

When comparing the results of the first and second group, the average IHI scores of teams in the second group are a little, but not significantly, higher than the first group (3.2 for the first group, 3.4 for the second group). The lessons learned in the first group resulted in some changes for the second project group, which may have contributed to the achieved levels of improvement. However, for most topics the IHI scores show similarities between both groups. Also the estimated effect of the obligation to work on the four pre-specified topics is not reflected in significantly better scores on these topics.

One of the factors expected to influence results in these projects is project leadership. Well equipped (available time and skills), dedicated project leaders can accelerate improvement by stimulating and coordinating the multiple project activities. Surprisingly, changes in project leadership are not visible in IHI-scores. Median IHI-scores in both groups were almost exactly the same for teams with and without a change in project leaders (3.2 vs. 3.2 and 3.3 vs. 3.5). All stroke services kept participating in the project till the end. However, some of them experienced a loss or change of team member or project leaders and others needed time and energy for problems in their organisations (for instance mergers, or cost reduction programmes).

During the first project, teams composed of a mix of professionals and management seem to be more able to implement improvements and make decisions. Therefore, teams of the second group were explicitly stimulated to set up mixed teams. Although this resulted in more mixed teams (from 29% to 67%), the influence of team composition is not reflected in better IHI-scores. Mixed teams score about the same (median IHI 3.3 group 1; 3.4 group 2) as teams composed of mainly managers/staff members (median IHI 3.3 group 1; 3.5 group 2). Median IHI scores of teams of mainly professionals are lower (IHI scores of 3 and 2), but these results are based on only two teams and therefore, not representative. During the project meetings, the teams themselves emphasised that the more health care organisations involved, the more time and efforts have to be made to set up an integrated stroke service. However, at this moment IHI scores don't show obvious differences between larger and smaller stroke services either.

Reducing the length of stay both in hospitals and nursing homes pointed out to be a topic that can be influenced significantly using the model of improvement. Clear aims can be set (for example 'In June 2004 the average length of hospital stay for stroke patients in region X is 10 days'), results can be measured and proven to be significant with Statistical Process Controll techniques. Fifty percent of the teams made significant improvement in the given time frame. Improving after care facilities, transfer of information apparently exceeds the time frame of the project. One explanation can be that at the start of the project there were no best practices in after care and often new structures (like structured home visits) had to set up. Improving the content and timely transfer of information is a complex topic. The high number of professionals and disciplines involved probably contributes to this.

Before both aspects are improved, often changes with an impact on the structure of the stroke services (new patient file), the care processes (agreements on procedures), and the outcomes (satisfaction with the effect of the change) are necessary. The high number of teams who successfully implemented educational programmes and tools for monitoring and management of their stroke services, could be explained by the characteristics of these interventions. As summed up in table 5, interventions often consists of clear actions like a registration system or a professional training. Interventions can be organised and executed well and the effect (for instance number of staff trained) can be measured easily.

Discussion

This article provides some of the information available on a Breakthrough Collaborative Improvement project on integrated stroke care in the Netherlands. Altogether more than 140 hospitals, rehabilitation clinics, nursing homes and home care organizations participated. The project on stroke services was the first transmural project in the Netherlands based on the breakthrough methodology. Other breakthrough projects focused on only (a part of) one organization like a hospital. Based on the five point likert scores the method seems to appear capable of catalyzing change in most participating stroke services. To do so, the teams had to implement particularly complex interventions that involved many people, departments, organizations and processes within their stroke service.

The evaluation of this Breakthrough Collaborative has to deal with several limitations. First, our analysis is based on stroke services that were willing to improve. The stroke services in our project were a self selected group of services that were highly motivated. The participating stroke services may differ on behalf of these differences in enthusiasm and motivation. Because of this, caution should be applied in generalizing the findings to other sites. Also, our evaluation did not compare intervention sites with non-intervention sites making it difficult to give a sound conclusion whether improvement can be attributed to the Breakthrough collaborative improvement approach or are just the result of more general local and global forces. Hence, we are limited in our ability to draw sound conclusions on potential factors enhancing success. Whether our conclusions apply to other stroke services, teams or integrated care sites is not known.

Another limitation of this study is that it provides no quantitative information on the extent to which the changes made by the teams actually have influenced the patients and their central caregivers. The process improvements carried out clearly improved the extent of integrated stroke care, but we lack information on patient outcomes. For patient outcomes like patient satisfaction and quality adjusted life years we relied on preliminary research, existing knowledge and national guidelines. Furthermore, our analysis was based on self report of the teams and progress was scored using a five point likert scale applied on all types of aims, independent of the clinical relevance or impact of an aim nor the complexity of the change (for example 'reducing length of stay with 15% or 60%' has no consequences in score). The scores were based on consensus in the expert team. Rigorous assessment of interrater reliability was not performed. The choice for the IHI-score as a measure can be argued. The score gives insight if improvement occurred, not in the reached level of quality. For instance, an improvement of 30% in reducing length of stay can be significant, but can reflect an average length of stay of 20 days while best practices point out less than 10 days is achievable. When benchmarking and spotting new best practices are also aims of the improvement project, measuring absolute outcome scores as has been done by the teams is also necessary.

Nevertheless, the Breakthrough approach was a success in the eyes of the participants. For some, the less quantifiable benefits were even more significant than those which can be reflected in terms of IHI scores or outcome measures. During eight group interviews with teams of the second project group factors for success and failure has been discussed. An important for success was the structured project approach, as well for the national as the regional project. The stepwise methodology, focussing on measured outcomes contributing to improved patient care stimulated collaboration and actual action. The time pressure build in the project structure as well the possibility for exchanging ideas and results with other regions were stimulating factors, which emphasized on achieving results. Also the team composition and personal characteristics of team members are important factors for failure or success. Most teams judged the Breakthrough Methodology suitable for integrated care arrangements. Although they recommend enlarging the time frame slightly because of the number of regional organisations involved, the methodology especially contributes to regional collaboration. Constructive collaboration as a important prejudice for delivering effective integrated care, was achieved by the project elements focusing on team building, national conferences and taking part in the learning network.

A lot of teams reported improved cooperation between professionals and organizations, growing awareness of being part of a chain of care and an ongoing emphasis and effort to improve the service. Although we did not assess outcome measures on quality of live or adjusted live years nor interviewed patients and their central care givers, the assumption is that stroke care did improve because changes were based on evidence based guidelines and existing knowledge [10,11] stating that integrated stroke care leads to better outcomes. For the sponsoring and hosting organizations the project also was a learning process and lessons learned help to design future Breakthrough projects on integrated care. For the participating stroke teams and their organizations the challenge remains to sustain improvements and to maintain momentum to build towards significant improvement across the whole stroke service.

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Chapter 3

Integrated dementia care in the Netherlands: a multiple case study of case management programmes

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Integrated dementia care in the Netherlands: a multiple case study of case management programmes

Abstract

The number of dementia patients is growing, and they require a variety of services, making integrated care essential for the ability to continue living in the community. Many health care systems in developed countries are exploring new approaches for delivering health and social care. The purpose of this study is to describe and analyze a new approach in extensive case management programmes concerned with long-term dementia care in The Netherlands. The focus is on the characteristics, and success and failure factors of these programmes.

A multiple case study was conducted in eight regional dementia care-provider networks in the Netherlands. Based on a literature study, a questionnaire was developed for the responsible managers and case managers of the eight case management programmes. During 16 semi-structured face-to-face interviews with both respondent groups a deeper insight into the dementia care programmes was provided. Project documentation for all the cases was studied.

The eight programmes were developed independently to improve the quality and continuity of long-term dementia care. The programmes show overlap in terms of their vision, tasks of case managers, case management process and the participating partners in the local dementia care networks. Differences concern the targeted dementia patient groups as well as the background of the case managers and their position in the local dementia care-provider network. Factors for success concern the expert knowledge of case managers, investment in a strong provider network and coherent conditions for effective inter-organizational cooperation to deliver integrated care. When explored, caregiver and patient satisfaction was high. Further research into the effects on client outcomes, service use and costs is recommended in order to further analyze the impact of this approach in long-term care. To facilitate implementation, with a focus on joint responsibilities of the involved care providers, policy recommendations are to develop incentives for collaborative financial contracts between insurers and providers.

Background and purpose

In order to remain safely in the community, people suffering from long-term conditions such as dementia require a wide variety of services like home care, welfare and social services, as well as adequate housing and good medical and nursing care [1-3]. Developing approaches to coordinating these services in a quality-driven and cost-efficient manner is a global concern. In order to respond to the needs of these people with long-term conditions, many developed countries are also exploring new approaches and integrated care arrangements for delivering health and social care [4-7].

Dutch policy context

In the Netherlands, professionals in dementia care work in three sectors; (1) general care (care and somatic cure for acute and chronic diseases), (2) mental health care (psychiatric care, social and addiction care) and (3) long-term care of elderly people. The Dutch financial system is a complex social insurance-based one with multiple components and a clear split between acute health care and long-term and social care [8]. Recent national policies emphasize a concern for the quality of life of elderly people, moving away from institution-based care and using home-care technology [9]. The combination of growing needs for health and social care with budgetary pressure means that cost containment is essential; this occurs by reducing and delaying institutionalization. New legislation hands over the responsibility for purchasing home care and welfare to the local governments [10]. For dementia care, this means that the total range of care and services has to be provided from different financial systems and policy sectors, each working within its own rules. There is much fragmentation in dementia care, yet policy-makers and professionals advocate integration and seamless care. During the onset and early stages of dementia, support is mostly provided by primary care practitioners, spouses, relatives and patient foundations. For medical diagnostics, general practitioners (GPs) can refer patients to specialist memory clinics in a hospital or to mental health services. After diagnosis, local services determine the specific care packages such as case management, support groups, respite care, training or counseling. When living at home is no longer possible, elderly peoples wards in nursing homes or geriatric sheltered housing are options [11,12].

Room for improvement

Although GP services, diagnostic clinics and home care are available for almost all patients in the Netherlands, the quality of dementia care is subject to multiple deficiencies and inter-regional differences. Areas for improvement include early detection of the disease, support after medical diagnosis, and under-diagnosis of patient and caregiver depression. Lack of care coordination, timely referrals and information flows between health professionals and services are other improvement [13]. As a part of the National Dementia Programme [14], family panels with over 600 participants formulated improvement areas in more than 50 health care regions. Families cited the need for systematic help in finding and arranging care, and report a lack continuity in long-term support. Systematic practical help and support after diagnosis are also missing, together with advocacy and education in coping with problematic behaviour. Caregivers living at home with a person with dementia experience an increasing burden over time [15]. Adequate support for caregivers is crucial for sustaining people with dementia in the community. Where there is no caregiver or where the caregiver is depressed or stressed, the likelihood of nursing home admission rises sharply [16].

Case management programmes

The increasing number of people with dementia, together with the problems and fragmentation of dementia care services, led to the development of case management programmes in various regions in the Netherlands. The initiatives are characterized by long-term support and guidance both for caregivers people with dementia living in the community during all phases of the disease. Care and support are delivered by an appointed case manager, mostly employed by a nursing home or mental health care service [17]. Case management as an intervention has also been implemented in integrated care programmes for other patient groups. The Case Management Society of America describes case management as a collaborative process of assessment, planning, facilitation and advocacy for options and services to meet an individual's health needs through communication and the available resources to promote quality cost-effective outcomes [18]. The case manager or team takes responsibility for guiding the person through the complex process of care in the most efficient, effective and acceptable way. The case manager can also provide support with practical advice and social or emotional support. Sometimes case-finding, training of professionals and crisis intervention are also included. Case management models are often centered on the person with dementia (and caregiver) are integrated and provide outreach help [19,20].

It appears that case management is an intervention that works on two complementary levels. Firstly, at an individual level, where the case manager provides advice or referral, and works in partnership with caregivers to refine the care plan and care process. Second, at the level of the care network, the case manager has a central position and collaborates with multiple healthcare providers, and provides continuity between professionals and organizations.

With the need to improve the quality of dementia care and the growing interest in case management initiatives in the Netherlands, a deeper insight into such intervention was considered necessary. Until now, no studies have been published that analyse the characteristics and forms of implementation of existing programmes. We therefore investigated the following research questions: 1.What are the characteristics of Dutch case management programmes in dementia care? 2. What are the success and failure factors for the implementation of the programmes?

Study design and methods

To answer the study questions we conducted a multiple case study. A case study is defined as an empirical inquiry that investigates a contemporary phenomenon in its real-life context [21]. Case study methods were chosen because covering contextual conditions is essential when researching the case management programmes. This study thus has a signalling function and does not claim to cover all (aspects of) programmes, nor to identify causal relationships. To avoid confusion, we will use the word 'programme' when we discuss the research cases of regional care networks with case management.

Programmes were traced by means of consultations with and referrals by national experts in dementia care, publications and publicly available information. The study includes a representative number of case management approaches. Nine programmes were selected using the following criteria. First, case management had to have been implemented for at least one year, and programme documentation such as aims, planning and patient information had to be available. Second, programmes had to work with multiple case managers focusing particularly on dementia patients and their caregivers living in the community. Eight Programmes agreed to participate. One programme did not take part because the programme manager was on a sabbatical leave. The programme leaders were informed about the study by telephone and e-mail and asked to provide programme documentation. All programmes provided project documentation; three programmes provided also evaluation reports and four programmes provided client information materials.

In order to obtain a broad perspective, two respondents from each programme, the responsible manager and a case manager were asked to participate. All respondents agreed.

After a non-systematic literature study for international studies on comparable programmes in dementia care (search terms: dementia, Alzheimer, case management, care management, care coordination, integrated dementia care, caregiver support), we developed a questionnaire with seven categories: programme history; motives and tasks; patient group and caseload; background and capacities of case managers; the case management process; collaboration in the dementia provider network; and implementation success and fail factors [22-29]. The above categories are comparable to those used in England [7,30].

The sem-istructured interview guide was developed and reviewed by experts from the National Dementia Program [14]. The interview questions were e-mailed to the respondents as a preparation for the interview. Over a four-month period, sixteen 90 minute semi-structured face-to-face interviews were conducted to discuss the items in the questionnaire. In one programme two managers were involved in the manager interview, in another programme there was one interview with the manager, who was also a former case manager. The interviews were tape recorded and transcribed ad verbatim. Patient flow charts as well as tables of the core aspects were constructed for each initiative. All materials were checked and confirmed by the respondents. Subsequently, in our analyses the structured overviews of the different programmes were compared and contrasted with the previously named categories. The focus was on differences and overlap between the programmes, and less on differences between types of respondents.

Main findings

The results of the seven categories, namely programme history, motives and tasks, patient group and caseload, background and capacities, case management process, collaboration in the dementia network, and success and failure factors are described as follows. The main characteristics of the programmes named A – H are summarized in table 1.

Programme history

The case management programmes were set up between 2000 and 2005, and employ between three and 22 case managers. Multiple health care organizations, professionals and sometimes client organizations are involved in all programmes. The initiating health care organizations were mostly mental health care, nursing homes and home care organizations formed part of a network or care chain to execute the programme. In one region this collaboration had become transformed into an independent foundation, while in another region the programme was organized independently by the local government, in cooperation with the local health care providers. The reasons for starting the programmes in most regions were the increasing numbers of elderly mentally infirm clients in the caseload of social workers or (specialized) nurses and the growing need for more client-tailored services for this client group. This need was enforced by the recognition that specific knowledge about a broad range of aspects of dementia care was necessary for the provision of quality care. Client organizations emphasized that

Table 1. Characteristics of Dutch case management programmes

Region No. of case managers	CM since	Target group	CM tasks	Start and end point	Diagnostics included	Embedded in MDT	Providers	Involved parties in the care chain	Effects measured
Noord-Kennemerland (A) n=22	2000	(suspected) dementia, caregiver, mci	Extensive cm, Training colleagues, aftercare	S : GP or spec. referral E : NH, death	+	+	Mental Health, Nursing homes	GPs, Hospital, Mental Health, Home care	+ Client satisfaction
Haarlem (B) n=15	2001	dementia, caregiver	Extensive cm, Cg training, aftercare	S: any referral after diagnosis E: NH or RH, death	-	-	Mental Health, Nursing homes, home care	Dementia Care network (all parties), patient associations	-
Tilburg (C) n=3	2003	(suspected) dementia, caregiver	Extensive cm, Case-finding, aftercare	S : any referral or own initiative E: NN, NH or RH, death	-	-	Mental Health, Alz. Association, Caregiver Network	Independent from care network. Local government	+ Client and prof. satisfaction
Zoetermeer (D) n=4	2003	dementia, caregiver	Extensive cm, Cg training, aftercare	S: mental h. referral E: NH or RH, death	-	+	Nursing homes, home care	GPs, Hospital, Mental health	-

Table 1. (Continued)

Groningen (E) n=11	2004	(suspected) dementia, caregiver	Extensive cm, aftercare	S : GP or spec. referral. E: NH or RH, death	+	+	Mental Health, Nursing homes	GPs, Hospital, Home care	-
Eindhoven (F) n=9	2005	(suspected) dementia, caregiver, Mci	Extensive cm, Cg training, aftercare	S : GP referral E: death	-	-	Dementia Care network, Mental health, Nurs. home, home care	Dementia Care network (all parties), patient associations	-
Delft Westland-Oostland (G) n=3	2005	dementia, caregiver	Extensive cm, Case finding, Cg training, aftercare	S: GP, spec. or home care referral E: NH or RH, death	-	-	Dementia Care network, patient associations	Dementia Care network (all parties)	-
Leiden en Oegstgeest (H) n=11	2005	dementia, caregiver	Extensive cm, cg training	S: GP or spec. referral E: NN, NH or RH, death	-	-	Mental Health, Nursing homes, home care	Dementia Care network (all parties), patient associations	+ Client, GP and prof. satisfaction

Cg= Care giver, Cm= Case management, GP= General practitioner, mci= mild cognitive impairment, NH=nursing home, NN= no need, RH=Residential home for the elderly.

supportive and professional care to guide the client and her/his caregivers through the care process was missing. All the programmes stated that the start-up of the programmes was time-consuming and complex because of the many decisions and parties involved. Not only did arrangements about employing and financing case managers have to be made, but discussions about background and tasks, the case management process and the position of case managers in the dementia care network also took time.

Motives and tasks

The need for easily accessible and client-centred care for both the dementia patient and their caregivers living in the community during the total care process is the most important factor in all programmes. All the programmes sought to ensure an independent role for the case manager in order to advocate clients' needs as effectively as possible. Establishing warm and confidence-based links with the client and their social system was cited unanimously as crucial for providing good quality care as a case manager. The tasks of case managers covered in all programmes consisted of care assessment, care planning, facilitation and implementation, evaluation and advocacy, and family interventions (together defined as extensive case management). In most of the programmes some kind of aftercare following nursing home admission or death of the patient, such as emotional support for the caregiver, was available but often limited in duration. Case managers also sometimes provide training for caregivers, for example, in coping and handling strategies (see table 1).

Patient group characteristics and caseload

In half the programmes, a confirmed diagnosis of dementia was a necessary inclusion criterion for case management in order to receive reimbursement of the costs of services or to regulate client numbers when starting up the programme. The other programmes also included people with suspected dementia with a view to persuade them to enter the diagnostic process, or also included patients with mild cognitive impairments. The programmes provided support to both the people affected and their (main) caregivers, living independently in the community. The severity of the dementia or the availability of caregivers was never an inclusion or exclusion criterion. In the case of admission to a nursing home, the nursing home staff continued to provide the care and support. The case managers suggested that the most favourable model would be case management from the very first onset of dementia, even before the diagnosis had been confirmed. The reasons for this are the need for support and information in the early stages, and the relatively long period required to establish the diagnosis. The caseload of case managers ranged from 40 to 65 client dyads (client and caregiver) per full time equivalent

(FTE), with an average of 50. The case managers experience their caseload as a maximum. One programme was aiming at a caseload of 100 clients per FTE, but stated that it was not yet clear if this was sustainable. Increasing the caseload was felt to be a risk by shifting from proactive towards more reactive care and support.

Background and capacities of case managers

The backgrounds of the case managers varied among and within programmes. In three programmes (B, D, G), the case managers were nurses, often specializing in elderly people's care or mental health. In the other programmes, the case managers were either specialist nurses or social workers. In four programmes (A, C, F, G), the case managers received specific training before starting their job. As quoted (program B): "You really need specific knowledge about dementia and the characteristics of the disease. You have to analyze what goes wrong, give helpful advice and organize what needs to be done". Skills required by the case managers include analytical qualities, the ability to work in a patient-centred rather than organization-oriented way, good communication skills, a good understanding of local services and provision, the ability to bond with patients and families, the ability to collaborate with a wide range of professionals, negotiating skills, perseverance, and creativity. The respondents stated that case managers should preferably be more experienced nurses or social workers, because of the number of skills needed and the complexity of the work at both client and care network level.

The case management process

The start of the case management process differed from one programme to another. In one programme (C), no diagnosis was needed, and anyone could refer. In this programme, the support provided also ended when there was no longer a need, but this occurred only occasionally. In most programmes there were multiple ways of entering the case management process. Often this was by referral from a GP (required in programme F) or specialist such as a neurologist, geriatrician or mental health specialist. The involvement of local GPs is cited as difficult, but important for proper referrals. When asked about the average number of contacts with clients, the case managers stressed that the frequency of contact largely depended on the client's situation. Contact frequencies vary from several times a day (in new, complex, or near-crisis situations) to once every three months (in more stable or well-supported situations). All case managers provide home visits and consultation by telephone. In three programmes (A, D and E) the case management is embedded in a multidisciplinaryteam (MDT). In programme A, this team consisted of case managers, social geriatricians, nursing home doctors, a psychiatrist, (neuro) psychologists, a dementia consultant for education and administrative staff. In programme E, the MDT consisted of case managers, social geriatricians, psychologists and transfer nurses. Both teams provide medical diagnostics, care assessment and long-term support by the case manager. In programme D, the case manager is part of an MDT which consisted of a nursing home doctor, a nursing home psychologist, and psycho-geriatric nurses, but for medical diagnostics the team refers its patients to mental health services. The case manager has an important proactive role in the team. As quoted (programme D): "The case manager has to be one step ahead all the time and inform and involve the team members. So when a situation escalates, everybody is already prepared". The other case managers are not members of a MDT, but connect with an existing MDT of one of the partners or organize meetings as necessary.

Collaboration in the dementia care provider network

The organizational structures and local collaboration varied from one programme to another. In most programmes the case management initiative is embedded in the local dementia care network or care chain initiative, which consists of all the local providers involved in dementia care. The aims of these networks is to improve the coherence and quality of dementia care in a certain local region, or to start new initiatives. Alzheimer's patient associations are also included in these networks. In one programme (A), the case management initiative developed into an independent foundation which also includes medical diagnostics, temporary admissions and treatment facilities. The foundation works in collaboration with the local hospitals, home care organization and general practitioners. In programme E, the case management team forms part of a collaborative agreement between the mental health services and local nursing homes. In some programmes (D and H) coordinating tasks are given to one of the parties or the participating parties each employ a number of case managers who together form a team. Local authorities are involved in only one programme (C), where it has a role in funding the case managers who are employed by a nursing home organization. The respondents all stressed the importance of adequate collaboration between the case managers and the local care providers in order to make the case management process really work. As quoted (programme A):"A vivid and strong network of care providers is essential for delivering quality case management".

Success and failure factors

According to the respondents, a number of factors affected the likelihood that a programme would succeed or fail. The most frequently mentioned success and failure factors are summarized in table 2. Other stated success factors were the growth in client numbers in programmes expressing the need for the support delivered and the effects of the programmes on clients. Respondents unanimously reported positive reactions by clients and professionals, the expected delays in nursing home admission, fewer crisis situations, and reduced stress among caregivers. However, none of the programmes could report systematic effect measures on indicators like clinical outcomes or service use (time to nursing home admission, use of home or community services, crisis admissions). Three programmes (A, C and H) evaluated their client (and caregiver) satisfaction, and two programmes (C and H) also evaluated the satisfaction of professionals involved [31-33]. Whereas the first results show high scores on all dimensions, especially client and caregiver satisfaction, firm conclusions cannot be drawn due to methodological limitations and differences between the evaluations. Three of the programmes planned to start scientific evaluations, mainly focusing on measuring client and professional satisfaction.

Table 2. Success and failure factors of implementation

Success factors	**Failure factors**
1. Investment in a strong provider network or care chain and good personal connections with professionals.	1. Distrust of the program by local providers and competition for delivering care.
2. Expert knowledge of the case managers	2. Inadequate or no structural funding of the program and program coordination.
3. Embedding in a Multi Disciplinary Team and direct connection with medical staff.	3. Little or no involvement of primary care specialists like general practitioners
4. Support and recognition of local providers for the program.	4. Doubt about the added value of case managers relating to existing care and support.
5. The low threshold for accessing support and care for patients and caregivers.	5. Not including patients without a confirmed diagnosis of dementia.

Conclusion

Although the case management programmes in this study have developed separately and in different regions of the country, this study on case management for dementia patients shows that their motives, aims and main characteristics are comparable. All the programmes offer services that focus on increasing the continuity and integration of primary, specialty, mental, and long-term health care. The programmes are crossing these boundaries for people living in the community and are being patient and caregiver-focused.

The 'intensive case management model' as describes by Banks [23] and Challis et al. [30] corresponds most closely with the programmes investigated in our study. The shared core-tasks model covers 'usual care' in the Netherlands and appears insufficient as usual care often lacks continuity and long-term support. Three programmes also correspond with the joint agency model, in which the case management is embedded in a multidisciplinary team. However, in our study the case manager's tasks do not rotate among team members, but are delegated to one responsible case manager, usually a specialist nurse or social worker. When comparing the case management programmes with care arrangements in other countries, like the UK and Canada, it shows that the diversity of programmes in those two countries is large. However, the case managers in this study confirm that case managers suits complex groups such as people with dementia. Challis et al. [34] suggest that the presence of case management programmes even can be seen as an indicator for the fragmentation of health care systems.

Practical implications

The enthusiasm and conviction of the respondents that case management adds value to the 'usual care' is a striking finding in this study. The presence of a multidisciplinary team or collaboration with existing teams strengthens the case management initiatives. Case managers who do not engage in regular consultation with physicians perceive this as a lack. It seems that linking case management to medical decision-making (by having doctors 'near at hand') is a powerful combination. Case managers favour a broad multitask model during the whole care-continuum. This includes the regular case management tasks (care assessment, planning, linking, evaluation, advocacy, support and family interventions), and also case-finding, aftercare, and the training of professionals and caregivers. While there is not yet scientific evidence to support the hypothesis that such a broad model provides better outcomes, some studies do point in this direction. Acton & Kang [35] studied interventions to reduce the caregiver burden in dementia care and found the strongest evidence for multicomponent interventions. Brodaty et al. [16] concluded in their meta-analysis of psychosocial interventions for caregivers of people with dementia that the only feature that emerged as significant was involvement of both the patient and the caregiver in a structured programme. Practical support for the caregiver, involvement of the family, structured individual counselling and flexible deployment of a consistently present professional to provide long-term support were all important. Providing not only practical care but also psychosocial support activities is stressed by the case managers in this study and is also an important finding in the study of Sargent et al. [36].

A crucial factor in the development and implementation of these programmes is the position of the case managers in the dementia care provider network. Key factors are well-defined tasks and arrangements among the providers involved, and a willingness to cooperate with others, including the redistribution of functions and tasks. Health professionals could emulate social workers, who often fulfil the role of linking caregivers to available support, while GPs do this less often [37]. When caregivers of people with dementia are aware of available support, the increase of service use is likely [38]. The amount of integration as described by Wulsin et al. [39] is reflected in the different development of the programmes, which often start with improved referral, to consultative care, to collaborative care, or integrated team care like in programme A and E. Only in programme A was the organizational structure reframed around the integrated care and combined with new financial arrangements with health insurers. The uncertainty of structured funding for the other programmes is a risk factor for the future.

Recommendations for policy

The programmes are heavily dependent upon interorganizational commitment, which is essential for effective integrated care. In Dutch health care policies both integrated care and competition are stimulated. As a reaction on increased (financial) pressures, health care organizations are reorganising themselves, merge with others or develop new organizational structures [40]. These circumstances are critical issues for the further development and sustainability of the current case management programmes. A study which compared the amount of integrated structures in relation to the quality of care, revealed that integrated health and social care (in Ireland) versus the more fragmented situation (in the UK) did contribute to more multidisciplinary working and care management arrangements [34]. Integrated care for elderly people with dementia seems to be desirable in several developed countries with an aging population. However, policy recommendations are needed to guide these processes and to make care accessible throughout the community. The programmes described in this study could serve as a starting point to form a basic model for implementation of case management programmes on a broader scale. On a policy level, incentives for developing a sound knowledge base and exchanging experiences about case management programmes should be stimulated and facilitated. In the Netherlands the National Dementia Programme and the local Alzheimer federations offer national infrastructures which could be further developed into a nationwide knowledge network which initiates, stimulates and disseminates knowledge about effective integrated dementia care. International learning in exchange programmes, like the National Dementia Strategy in the UK, is recommended [41]. Another policy recommendation is to stimulate the development of collaborative financial contracts between care providers and insurers. The very recent (2008) Dutch dementia program which facilitates ten dementia networks is a step in the right direction, but the urgency to improve dementia care asks for more experiments and incentives for both insurers and providers to contract integrated care.

Evidence for effects

The limited data on the satisfaction of clients and professionals show high scores and underline the experiences of the case managers. However, there is a need for more evidence on the effects of the programmes. The published evidence regarding the effectiveness of case management interventions reaches varying conclusions. Two studies of dementia care [28,29] found no effects over time towards institutionalization for two types of case management varying in terms of caseload and available resources. However, there were slight improvements in reduction of the caregiver burden and depression after six months. The case management was limited to organizing good-quality, cost-effective care, without emotional and social support for patients and their caregivers. A study of Gravelle et al. [42] about case management for frail elderly patients found no effects on hospital admissions or mortality. Eloniemi-Sulkava et al. [27] describe a 2-year intervention program in Finland by a dementia family care coordinator (a trained nurse). In this RCT, the rate of institutionalization was initially significantly lower in the intervention group, but the benefit decreased over time. Another study of case management for dementia patients [25], also focusing on emotional and social support, found effects on delayed nursing home admission, but not on the objective caregiver burden. In Canada [26], clinical intensive case management for early stage Alzheimer's patients and their caregivers was also found to delay institutionalization after 18 months, without extra use of services. Next to this, caregivers felt less burdened at six months, but not in later measurements. Next to a preventive and proactive emphasis, the focus was on education, supportive counselling and skill training.

Future research

In our opinion, future research on the effects of case management in dementia care should focus on two levels: the individual level of clients and caregivers and the organizational level of the care network. At client level, measuring the effects on health outcomes such as caregiver burden, problematic behaviours and patients' and caregivers' wellbeing and depression is necessary. Also, the effects on care consumption are interesting to judge the cost effectiveness of case management in the short and long term. At the level of the care network the effects on service-use such and time to nursing home admission, referrals, or crisis interventions are suggested. The degree of integration, embedding in an MDT, and the breadth of the intervention package related to outcomes are subjects for further research. Consequently, in order to estimate the total effects, the financial consequences of case management programmes and changed service-use patterns should also be researched.

Limitations of the study

Our research contains several limitations. The number of programmes included in this explorative study was limited. The selection criterion that a program had to have been in existence for one year may have excluded less successful, already failed programmes. Furthermore, apart from the manager we interviewed one case manager per case as a representative of the case manager group. However, the cooperation of all the respondents and the large amount of data from project documentation and the interviews provided a good insight into the characteristics of the programmes and the perceived success and failure factors. Despite these caveats, this multiple case study does support the conclusion that case management in dementia care, as being developed in the Netherlands is a young but promising approach that should be further investigated. The increasing numbers of people with dementia living in the community and the deficiencies in current health care system underline the need for the further improvement of integrated and coherent dementia care.

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Chapter 4

Performance improvement based on integrated quality management models: what evidence do we have? A systematic literature review

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Performance improvement based on integrated quality management models: what evidence do we have? A systematic literature review

Abstract

Purpose

Health care organizations have to improve their performance for multiple stakeholders and organize integrated care. To facilitate this, various integrated quality management models can be used. This article reviews the literature on the Malcolm Baldrige Quality Award criteria, the European Foundation Quality Management Excellence model ('Excellence award models') and the Chronic Care Model. The focus is on the empirical evidence for improved performance by the implementation of interventions based on these models.

Data sources

A systematic literature review from 1995 to May 2006 in the Pubmed, Cochrane, and ABI-databases was conducted.

Study selection

After selection 37 studies were included, 16 in the Excellence award model search and 21 in the Chronic Care Model search.

Data extraction and results of analysis

Data were retrieved about the main intervention elements, study design, evidence level, setting and context factors, data collection and analysis, principal results and performance dimensions. No Excellence Award model studies with controlled designs were found. For the Chronic Care Model, one systematic review, one meta analysis and six controlled studies were included.17 studies (2 Excellence award model, 15 Chronic Care Model) reported one or more significant results.

Conclusion

There is some evidence that implementing interventions based on the 'evidence-based developed' Chronic Care Model may improve process or outcome performances. The evidence for performance improvement by interventions based on the 'expert-based developed' Malcolm Baldrige Quality Award criteria and the European Foundation Quality Management Excellence model is more limited. Only a few studies include balanced measures on multiple performance dimensions. Considering the need for integrated care and chronic care improvement, the further development of these models for guiding improvements in integrated care settings and their specific context factors is suggested.

Purpose

In order to prosper in today's dynamic health care systems, organizations such as hospitals must work effectively, be innovative and organize efficiently. A focus on multiple performance measures is needed to assess the quality level reached [1]. Not only patient outcome measures, but also worker satisfaction and organizational and financial performance have to be managed and improved. This multidimensional approach by health care management corresponds with current definitions of the quality of care itself. The Institute of Medicine defines good care as safe, effective, timely, patient-centered and efficient. This definition also reflects multiple dimensions of quality, including organizational aspects like a streamlined care process, good access and a financially healthy organization [2].

Another development is observed in the literature. The characteristics and boundaries of health care organizations are changing. 'Patient-centered care' focuses on the total needs of patients, not only on the services provided by one professional or organization. It is important to sustain seamless integrated care during the whole care process. For health care organizations this requires 'horizontal' coordination, collaboration with other organizations and community partners or service integration. Partners in the care chain and the functioning of the care chain or care network as a whole contribute to the quality of care. The international literature on integrated care, disease management and development of care chains and networks addresses this issue [3].

To facilitate the improvement of health care quality and performance, a large range of quality management and organizational models have been developed [4, 5]. In this article we focus on frequently used quality management models in health care: the EFQM Excellence model (European Foundation for Quality Management) and the Malcolm Baldrige Quality Award criteria (MBQA) on the one hand and the

Chronic Care Model on the other. We selected these integrated quality management models on the basis of multiple criteria. Firstly, these models all consist of multiple 'enablers' of good quality care (for instance leadership or delivery system design). Enablers cover the processes, structure and means of an organization [6]. Secondly, these models focus on multiple performance dimensions for multiple stakeholders (for instance organizational performance, worker satisfaction). Lastly, they assume dynamic relationships between improved performance and implementation of interventions based on the models enablers [7, 8]. The EFQM/MBQA and the Chronic Care Model are frequently used as frameworks for local improvement or national collaborative improvement programmes. In this article we focus on the available empirical evidence for these models in respect of improving health care performance. The research question is: What empirical evidence is available for improved performance in health care settings by implementing interventions based on the enablers of the EFQM Excellence model/ MBQA criteria or the Chronic Care Model?

The EFQM Excellence model and Malcolm Baldrige Quality Award criteria

The EFQM Excellence model conceptualizes organizations by discerning enabler and performance elements as ingredients for striving towards excellence [6, 7]. The EFQM Excellence model shows many parallels with the assessment model of the Malcolm Baldrige Quality Award and international quality award criteria [9]. Originally, these widespread quality management models were developed in the private sector and may be viewed as an operationalization of Total Quality Management philosophies. Whereas the MBQA criteria consist of seven elements (leadership, strategic planning, customer and market focus, measurement & analysis and knowledge management, human resource focus, process management and results), the EFQM Excellence model consists of nine elements (leadership, policy & strategy, management of people, partnership & resources and processes, key performance results, and people, customer and society results). Both models have healthcare-specific versions and are used in all types of health care organizations, regardless of sector, size or maturity [6, 9. They are integrated models that cover quality management as an integral part of all professional and management functions at all levels of an organization. A basic premise of the models is that enablers direct and drive performance; organizations with well developed enablers will have excellent results [6, 9]. Because of their comparability, we will focus on the EFQM and MBQA models as one category.

The Chronic Care Model

The Chronic Care Model identifies the essential elements of a (local) health care system that encourage high-quality chronic disease care. The model is based on evidence based change concepts and responded to the need for a quality improvement model that fits the characteristics of chronic care. The model can be used for various chronic illnesses, health care settings and target populations. The Chronic Care Model has also been used as an improvement tool in multiple chronic care improvement collaboratives [10].

The Chronic Care Model describes six elements - the community, the health system within it, and four elements within the health system: self-management support, delivery system design, decision support and clinical information systems. Like the EFQM Excellence model and MBQA criteria, the Chronic Care Model focuses on multiple dimensions of performance and on multiple stakeholders. Successful implementation of interventions based on the six elements may result in productive interactions between informed and activated patients and prepared and proactive care teams and in better functional and clinical outcomes. An expanded model based on the Chronic Care Model, has a number of extras relating to patient safety, staff development, cultural aspects, coordination and the six performance dimensions of IOM's definition of quality [11].

Summarizing, the EFQM/MBQA model and the Chronic Care Model are both integrated quality models that are adopted by many health care organizations in order to direct effective interventions and improved performance. Each model consists of enabler elements and performance dimensions and assumes positive relationships between them. Although these models are commonly used in practice, less is known about empirical evidence concerning the effects of interventions, based on the elements of these models, on improved performance. This conclusion regarding EFQM/MBQA models was supported by Shortell et al. [12], Nabitz et al. [6] and others [5, 13-15], who stated that although the EFQM/MBQA models have high face validity, there are only a few publications in the academic literature. The Chronic Care Model is based on evidence-based directions for each element, but extensive research on the effects of the model as a whole on improved performance remains limited and comes mainly from self-reported, uncontrolled studies [16-18].

Øvretveit [19] argues that, when assessing the (evidence for) achieved results of quality improvements, the influence of context factors and the degree of context dependence of the interventions have to be considered. Conditions that are likely to influence results are the type of health care system, social values, health reform, the history of quality and the language and politics of quality. According to Øvretveit conditional interaction is systematically obscured in randomized controlled trials.

Data sources and study selection

We searched the PubMed, Cochrane, and AbI/Inform databases from 1995 to April 2006 and the reference lists of relevant papers. Study selection was based on the following criteria. Firstly, we focused on studies with empirical data published in peer-reviewed journals. Further, we included only studies that used the model as a basis for implemented interventions and focused on multiple or all elements. We conducted two searches: one on studies using the EFQM Excellence model and the MBQA criteria and national variants, and one on studies using the Chronic Care Model. Search terms were 'Baldrige', 'EFQM', 'MBQA', 'excellence model', 'quality award' and national variants like 'Deming quality award' in the first and 'chronic care' combined with 'model' and 'chronic care model' in the second. One author screened the initial search results (MM) and at least two authors screened the selected studies (MM and RH or KA). All of the authors independently assessed the evidence levels of selected studies; differences in interpretation were resolved by consensus. A specified evidence-level table based on EPOC criteria was used (see table 1). Evidence levels range from systematic reviews (A1) and randomized trials (A2) to descriptive non-analytical studies of multiple projects (D1), single projects (D2) or literature reviews (D3). The criterion for significant change in all studies was set at $p \leq 0.05$.

Table 1. Search results and evidence level classification

Level	Description	EFQM/MBQA	Chronic Care Model
A1	**Systematic review.** Review of data of multiple RCT studies.	0	2
A2	**Randomized trial**. Comparative study with (random) intervention and control group design.	0	1
B	**Controlled trial.** Trial with intervention and control group and comparisons on outcome		
	B1 more measurement points	0	4
	B2 one measurement point	0	1
C	**Non controlled study**		
	C1 multiple case, more measurement points	3	7
	C2 multiple case, one measurement point	5	0
	C3 single case, more measurement point	5	3
	C4 single case, one measurement point	1	0
D	**Descriptive, non-analytical**		
	D1 multiple projects	0	2
	D2 single project	2	0
	D3 literature review	0	1
	Total number of studies	16	21

Data extraction and results

Data were retrieved regarding the study design and evidence level, setting (organization and country), domain model elements in intervention, data collection and analysis techniques, main results and context factors described. Of an initial total of 850 studies, 16 were included from the EFQM/MBQA search [6, 12, 13, 15, 20-31] and of initial 686 studies, 21 from the Chronic Care Model search [10, 16-18, 32-48], see table 1.

EFQM and MBQA results

The characteristics of the EFQM/MBQA studies are reported in table 2. Regarding the evidence levels, no A or B level studies were found. Eight out of the fourteen C-level studies reported data on more than one measurement point (see table 1). Ten studies used the EFQM Excellence model and five the MBQA criteria as a model for improvement. Twelve of the 16 studies were published in 1999-2002. Eleven studies were conducted in Europe, four in the USA and one in Korea. Study settings were mainly hospitals (eight studies) and/or primary or community care services (six studies). In three studies the results were statistically tested; two of them reported one or more significant improvements [12, 15]. Six out of the eight C1 and C3 level case studies reported improved outcomes, but none are confirmed by statistical analysis.

The study by Goldstein and Schweikhart [15] in 220 US hospitals provided the strongest evidence: all the relationships between the MBQA categories and examined performance were statistically significant. They found the strongest relationship with staff and work system results. Health care, financial and market results were less well predicted by the MBQA criteria. Sanchez et al. [20] and Shirks et al. [21] measured the results of their EFQM and MBQA improvement programmes over four-year periods and found positive trends for process performance, but no significant improvements for any other performances. In three-quarter of the included studies three or more apparent context factors like characteristics of the health care system, social values or the history of quality assurance were discussed. The effects of these factors on performances are less well described. Shortell [12] and Lee [23] explicitly included statistical analyses on context factors. Lee concluded that scientific skills in decision making and the adoption of a quality information system were the most important contributing factors. Shortell found significant relations for a participative, flexible and risk-taking organizational culture. Larger hospitals experienced lower clinical efficiency due to more bureaucratic and hierarchical cultures that served as a barrier for quality improvement implementation.

Table 2. Reviewed EFQM or MBQA studies

Authors	Model elements in intervention	Evidence level	Setting and country	Data collection and analysis	Main results
Goonan, Stoltz, 2004 (13)	Baldrige improvement program	C1	1 US health service (21 US hospitals and 3 nursing homes)	Measurement of multiple indicators on Baldrige categories. No statistical testing.	Systematic quality improvement efforts resulted in first Baldrige Quality Award in health care. Number of improvements on multiple criteria, benchmarked when possible.
Sanchez et al., 2006 (20)	8-year EFQM improvement program	C1	31 organizations (hospitals, primary care, mental health, emergency services) in Spain.	Mean % of maximum possible self-assessment scores for result and enabler criteria. Customer satisfaction surveys. Seven key performance indicators. No statistical testing.	Increase in self-assessments, 10 organizations (32%) scored > 400 points, two (6%) > 500 points. Scores improved, especially ‘processes’. Customer satisfaction scores out-performed averages in national benchmark. Some improvements in key performance measures (4 year measures).
Shirks et al., 2002 (21)	3-year Baldrige improvement program	C1	11 US service network organizations	3-year assessment scores on 6 Baldrige categories. No statistical testing.	No signif. improvement on six categories in the overall group scores, or in two service networks with four year measurements. Average scores between 30-40% level.

Tabel 2. *(Continued)*

Arcelay et al., 1999 (22)	3-year EFQM improvement program	C2	26 public health services (hospitals, primary care, prov. management) in Spain	Measurement of EFQM self-assessment scores. No statistical testing.	Average score of 259 (max 500), 5 organizations scored between 100-200, nine between 200-300, and nine between 300-400, three no scores.
Goldstein, Schweikhart, 2002 (15)	Baldrige category 1- 6 and organizational performance	C2	220 US hospitals	Mailed questionnaire to head of quality departments. 14 weighted Baldrige categories and 5 result categories. Correlative statistics (regression analysis).	All relationships between the Baldrige categories 1 to 6 and performances are statistically significant. Health care results and financial and market results were less well predicted. Strongest relationship between Baldrige criteria and staff and work system results.
Lee et al., 2002 (23)	7 Baldrige categories, CQI pyramid	C2	67 Korean hospitals	Mailed questionnaire to head of quality departments. 43 Baldrige items. Correlative statistics (t-tests, ANOVA, regression analysis).	Average Baldrige implementation score of 3.34 (max 5). Customer satisfaction achieved highest score (3.88). Implementation score higher for larger hospitals (not significant).

Tabel 2. (Continued)

Moeller, 2001 (24)	EFQM improvement program	C2	17 German hospitals	EFQM weighted assessment scores on nine criteria. No statistical testing.	Two hospitals scored <200 points, nine 201-300, five 301-400, and one 400. Largest intervals (min-max score) measured at processes and people results.
Shortell, 1995 (12)	TQM programmes based on 5 principles	C2	61 US hospitals	Cross-sectional examination of relationships between organizational culture, quality improvement processes and outcomes. Correlative statistics (path analysis based on least squares regression).	Signif. associations for improved performance for human resources management and patient outcomes, not financial outcomes. No signif. association between TQM implementation and LoS and charges for six chronic conditions. A team focused, risk-taking culture, personal development and focused implementation were positively associated with degree of TQM implementation.
Freer, Jackson, 1998 (25)	3-year Baldrige improvement program	C3	1 UK trust (hospital and community services)	Baldrige self-assessment scores on 28 items, four-year measurements. No statistical testing.	Upward trend in self-assessment scores from 219 (t = 1) to 455 (t = 4). Baldrige framework was particularly useful to integrate services.

Tabel 2. (Continued)

Harr, 2001 (26)	5-year EFQM improvement program	C3	1 Swiss dental practice	Measurement on multiple indicators on nine EFQM criteria. No statistical testing.	Upward trend on multiple indicators (customer, people, society and key performance results). Positive scores related to available benchmarks.
Harten et al., 2002 (27)	EFQM improvement program (incl. ISO)	C3	1 Dutch rehabilitation clinic	Process analysis and two measure-ments on assessment scores on five EFQM criteria. Comparison with national benchmark. No statistical testing.	Upward trend in four of six EFQM assessment scores, one equal (people management) and one decreased (resources). Participation in quality program related to greater work satisfaction. Assessment scores on first measure outperformed 4 of 5 criteria in benchmark.
Jackson, Bircher 2002 (28)	EFQM improvement program	C3	1 UK primary care clinic	Measurement of multiple indicators on EFQM performance criteria. Survey on worker satisfaction. No statistical testing.	Improvements on multiple indicators: clinical outcomes, organizational efficiency, staff satisfaction.
Nabitz et al., 2000 (6)	EFQM improvement program	C3	1 Dutch addiction clinic. Overview of European activities.	EFQM assessment scores on nine criteria, pre- and post-improvement. No statistical testing.	Improved assessment score from 350 to 510 resulted in Dutch Quality Award.

Tabel 2. (Continued)

Gene-Badia et al., 2001 (29)	EFQM improvement program	C4	1 primary health care org. in Spain	EFQM self-assessment scores on nine criteria. Scores are compared with external assessment scores. No statistical testing.	Comparable assessment scores and areas for improvement between different assessments.
Dunn, Mathews, 2001 (30)	EFQM improvement program	D2	1 voluntary organization in Ireland	Analyses of steps taken and operationalisation of the model (incl. ISO, IiP, BSC). No statistical testing.	Key performance indicators were established and measured on a yearly basis.
Holland, Fennel, 2000 (31)	EFQM improvement program	D2	1 UK Health Trust	Baseline self-assessment by EFQM-based sore tool. Rating on five level scale. No statistical testing.	Base line assessment conducted with developed tool, resulting in action plans.

Chronic Care Model results

The Chronic Care Model search included 21 studies (see tables 1 and 3). Regarding the evidence levels, one meta-analysis and one systematic review were found [16, 17], one randomized trial [18], five controlled studies [32-36], and a variety of case studies and project reviews. Eighteen studies reported interventions on four or more Chronic Care Model elements. Most studies were published in the period 2003-2006 (15 studies). Almost all studies were conducted in the USA. Study settings were often primary or community care settings (15 studies), hospitals (four studies) and/or outpatient clinics (four studies) or networks of combined services. Eighteen out of 21 studies included diabetes patients, five included asthmatic patients, three cardiovascular patients and two depressed patients. Fifteen studies reported one or more statistically significant improvements. Six studies did not test their results statistically.

The strongest evidence was found in the meta analysis of 112 studies by Tsai et al. [16]. Tsai et al. found evidence for significant improvements on process or outcome measures by implementing at least one Chronic Care Model element. The review by Bodenheimer et al. [17] also showed high percentages of studies with positive effects, especially for studies which included four elements or self-management interventions. Compared to normal care or interventions supported by professional education, Piatt et al. [18] found that the Chronic Care Model based group performed significantly better on two diabetes clinical outcome measures and self-management monitoring. Like Tsai et al., the B level studies by Benedetti et al. [32], Mangione et al. [34] and Schonlau et al. [35] reported mainly significant improvements on outcome (HbA1C, LDL etc) or process measures (peak-flow monitoring, clinical testing, etc) at operational level. Chumbler et al. [33] found no changes in performance, except for increased service-use in primary and ED care. Sperl-Hillen et al. [42] analysed whether each Chronic Care Model element contributed equally and found positive correlations for delivery system design and positive associations for self-management and clinical information systems. Feifer et al. [36] found decision support, self-management and delivery system design to be positively correlated with clinical performance. Improved fit with the Chronic Care Model was related to clinical performance in this study. The performance dimensions included in the A and B level studies were further analyzed (see table 4). Almost all the studies measure clinical or efficiency results like test outcomes, length of stay or numbers of clinical exams, whereas less attention is paid to financial or professional results (such as worker satisfaction).

Regarding to context factors, one third of the studies described three or more context factors, mostly characteristics of the health care system, setting and patient populations. Only a few studies discuss influences of context factors on performances measured. Landis [40] concluded that the one site that clearly

Table 3. Reviewed Chronic Care Model studies

Authors	Model elements in intervention	Evidence level	Setting and country	Data collection and analysis	Main results
Bodenheimer et al., 2002 (17)	SM,DSD, DS, CIS	A1	39 international studies on diabetes care	Number of CCM elements implemented, number of significant improvements in process or outcomes of care. Overview of studies on costs. No statistical testing.	32/39 shows = 1 signif. improvement. All studies with 4 elements improved process and outcome. 15/23 studies with 1-3 elements improved = 1 outcomes, 16/20 improved = 1 process measure. No review of effects on costs.
Tsai et al., 2005 (16)	SM, DSD, DS, CIS, HCO, CR	A1	112 studies; 27 on asthma, 21 cong. heart failure, 33 depression, 31diabetes 107 outpatient, 5 inpatient settings	Meta analysis of clinical outcomes, QoL, processes of care. Correlative statistics (effect sizes, Hedges g, risk ratio, sd, random effects meta regression models).	Signif. improvements on outcomes and process measures with = 1 CCM element implementation. Effects somewhat stronger for DSD and SM. Mixed evidence for QoL Results consistent for variety of chronic illnesses.
Piatt et al., 2006 (18)	SM, DSD, DS, CIS, HCO, CR	A2	11 randomized US pcp: 3 practices CCM implementation (20 pat.), 3 practices provider education (38 pat.), 5 practices usual care (51 pat.)	Chart review. Five outcome measures and measures on well-being, knowledge, empowerment, self-monitoring. Descriptive and correlative statistics (Paired t-test, McNemar's, ANOVA, regression analysis, mixed modeling).	Signif. improvement in two outcome measures (A1C, non-HDL) and self-monitoring of blood glucose in the CCM group compared with the other groups. Within the CCM group also signif. improvements on A1C, HDL, empowerment and self-monitoring.

Tabel 3. (Continued)

Benedetti, et al., 2004 (32)	SM, DSD, DS, CIS, HCO, CR	B1	1 US multi-specialty practice; 698 diabetes patients. Control group: 1300 diabetes patients	Participation levels of CCM implementation (one, two or three years), 12 patient process and outcome measures. Survey on provider satisfaction. Descriptive statistics (two tailed t-tests, F-tests).	Signif. improvement in 7/12 outcomes measures in intervention group. Improved eye exams and blood pressure signif. associated with participation level. Provider satisfaction increased from 28% to 78% in intervention group.
Chumbler et al., 2005 (33)	SM, DSD, DS, CIS	B1	800 diabetes patients (400 treatment, 400 comparison) in US and Puerto Rico in outpatient care coordination program	Inpatient service-use (hospital admissions, LoS) and outpatient use. Emergency Department (ED) visits, primary care visits, ophthalmology, podiatry, diabetes clinic visits. Correlative statistics (regression analysis, difference-indifference approach).	Signif. decrease in primary care visits in control group, increase (not signif.) in intervention group. No differences between groups in podiatry, opthalmology and diabetes clinic visits. Both groups signif. decreased hospital admissions, LoS, ED visits.
Mangione et al., 2005 (34)	SM, DSD, DS, CIS, HCO, CR	B1	9 intervention sites (8 pcp, 1 pp); 4 control sites (3 pcp, 1 pp). 385 and 126 asthma patients in US	14 asthma-related process indicators. Medical record data collection, phone interviews with parents/guardians. Correlative statistics (regression models, linear probability model).	Signif. improvement for 6/ 8 process measures (peak flow monitoring, action plan), two outcome measures (general and asthma specific QoL) in intervention group, control group no improvement. Overall process measures signif. improved in intervention group, control group unchanged.

Tabel 3. (Continued)

Schonlau et al., 2005 (35)	SM, DSD, DS, CIS, HCO, CR	B1	6 intervention sites (4 pcp, 2 pp); 3 control sites (2 pcp, 1 pp). 123 and 62 asthma patients in US	9 asthma-related indicators. Medical record data collection, patient telephone surveys. Correlative statistics (t-tests, regression models, probability model).	Signif. improvement of overall interventions sites scores. Signif. higher SM scores, satisfaction with clinician and educator communication and educational sessions attendance in intervention sites. No signif. improvements in asthma specific QoL, LoS or acute service-use.
Feifer et al., 2001 (36)	SM, DSD, DS, CIS, HCO, CR	B2	9 US pcp, diabetes and cardiovascular patients, 21 control pcp sites	Group interviews for CCM implementation by ACIC survey. 22 disease-specific indicators. Correlative statistics (Spearman rank correlations).	DS, SM and DSD pos. correlated with clinical performance. 5/ 22 elements pos. correlated: guidelines, team leadership, follow-up, self-care support and behavioral therapy. More fit with CCM related to better clinical performance.
Bonomi et al., 2002 (37)	SM, DSD, DS, CIS, HCO, CR	C1	108 US hc organizations (clinics /managed care/safety nets) on diabetes, asthma, depression or CHF patients	Pre- and post-measurement of implementation of CCM elements on ACIC scale. Descriptive and correlative statistics (paired t-tests, correlation analysis).	For diabetes and CHF teams, signif. improvements in all six CCM elements ACIC subscale scores. The most substantial improvements in DSD, CIS and DS scores. Strong and positive correlations between ACIC scores and faculty ratings.

Tabel 3. (Continued)

Chin et al., 2004 (38)	SM, DSD, DS, CIS, CR	C1	19 US chc, 1620 diabetes patients	Chart review on 8 process measures and one outcome measure (HbA1c). Provider survey. Phone interviews to asses implementation, facilitators and spread. Correlative statistics (regression analyses).	Signif. improvements on 7 process measures (HbA1c measurement, eye and foot exam, dental referral, lipid and urine microalbumin ass., dietary consult), outcome measure (HbA1c) not signif. 95% of respondents positive about improvement program, including CCM approach.
Daniel et al., 2004 (39)	SM, DSD, DS, CIS, HCO, CR	C1	39 pcp teams of 1 US state in 2 diabetes collaboratives	Six process measures and 3 outcome measures (HbA1c, LDL, blood pressure). No statistical testing.	Most teams showed improvements in absolute scores. Medians of all nine measures increased at collaborative level. Absolute improvements higher for process than outcome measures.
Landis et al., 2006 (40)	SM, DSD, DS, CIS, HCO, CR	C1	Six US community based family medicine programmes on diabetes	Provider Recognition Program scores (6 diabetes process and 4 outcome measures). ACIC survey on CCM implementation. No statistical testing.	3/6 teams improved total PRP score, 5/6 improved average ACIC score. Team with most implemented interventions improved PRP scores most (eligible for Recognition Award).
Sperl-Hillen, et al., 2000 (41)	SM, DSD, DS, CIS	C1	18 US pcp, 7000 diabetes patients	Two process measures (HbA1c and LDL test rate) and outcome measures (HbA1c and LDL). Descriptive statistics (z-tests, t-tests).	Signif. improvements in all process and outcome measures (HbA1c and LDL outcomes and test rates).

Tabel 3. (Continued)

Wagner et al., 2001 (10)	SM, DSD, DS, CIS, HCO, CR	C1	23 US organizations (clinics, community clinics, managed care, safety net) diabetes patients.	HbA1c assays and levels, patient. With SM goals, documented smoking status, self-reported data. ACIC survey on CCM implementation. Descriptive statistics (t-tests).	Improved post measures for HbA1c assays and levels, goal-setting and smoking status (no stat. testing). ACIC measurement showed signif. improvement in overall scores, SM, DSD, DS and CIS. Improved ratings by faculty members.
Sperl-Hillen et al., 2004 (42)	SM, DSD, DS, CIS, HCO, CR	C1	17 US pcp, diabetes patients	ACIC survey on implementation of CCM. Three process measures (HbA1C and LDL testing, combined), 3 outcome measures (LDL, HbA1C, combined). Correlative statistics (Pearson correlations).	ACIC scores ranged from 4.9 to 6.3. Signif. correlation between implementation of DSD and process and outcome measures. SM and CIS were associated, but not signif.
Mohler, Mohler, 2005 (43)	SM, DSD, DS, CIS	C3	1 US pcp, 387 diabetes patients	Three process measures (aspirin use, eye and, urine examinations), 3 outcome measures (blood pressure, LDL, HbA1c). Survey on physician satisfaction. Financial outcomes. No statistical testing.	Upward trend of % of patients meeting goals on all six measures. 12/14 physicians increased satisfaction with diabetes care. Costs per patient increased $114 per year, due to nurse case-manager and data clerk salary.

Tabel 3. (Continued)

Siminerio, et al., 2005 (44)	SM, DSD, DS	C3	1 US pcp, 104 diabetes patients	Adherence to standards (6 measures), provider-perceived barriers to care. 5 outcome measures (HbA1c, blood pressure, LDL, knowledge, empowerment levels). Descriptive statistics (McNemars test, paired t-test).	Signif.improvements of standard adherence on 6 measures and patients diabetes knowledge. Educated patients signif.improved HbA1c and H/LDLc levels. No signif. improvements in outcome measures and patient-empowerment levels.
Stroebel et al., 2005 (45)	SM, DSD, DS, CIS, HCO, CR	C3	109 patients with diabetes, hypertension and/or hyperlipidemia in a US free army clinic	Six outcome measures (on blood pressure, HbA1c level, risk group LDL). Number of patients that improve at least one level. Descriptive statistics (paired t-tests).	73% of patients signif. improved on =1 measure. 64% of hypertension patients improved =1 stage, 53% of diabetes patients improved at least 1% HbA1c, 58% of hyperlipidemia patients dropped =1 risk group. Signif. improvements for group results on 3 outcome measures (arterial pressure, HbA1c and LDL).
Bodenheimer et al., 2002 (46)	SM, DSD, DS, CIS	D1	1 pp (diabetes), 2 integrated delivery systems (diabetes, asthma), 1chc (diabetes) in US	Description of characteristics, implemented interventions and main results.	Cases illustrate a broad variety of interventions and results. None achieved full implementation of the model, all booked results on clinical outcome or process measures.

Tabel 3. (Continued)

Wang et al., 2004 (47)	Case 1: HCO, CIS, DSD Case 2: SM, DS	D1	2 chc, diabetes patients in US	Description of characteristics, implemented interventions and some results. Interviews with team leaders.	Cases illustrate interventions, some results and lessons learned. Case 1 improved average HbA1c from 9.4 to 7.8. Case 2 from HbA1c from 6.9 to 6.8, increase in number of patients with SM goals.
Bodenheimer, 2003 (48)	SM, DSD, DS, CIS, HCO, CR	D3	Expert selection of international studies (in search for meta analyses and reviews)	Report of evidence found on model and models components.	Evidence available for each CCM component. Few studies available with evidence on multiple components. Relation between number of components used and improved clinical outcomes suggested. No conclusions on most effective components for specific diseases.

SM= Self Management
DSD= Delivery System Design
DS=Decision Support
CIS= Clinical Information System
HCO= Health Care Organization

Pcp= Primary care practice
Chc= Community health centre
Pp= Private practice
LoS=Length of Stay
ACIC: Assessment of Chronic Illness Care

CR= Community Resources
CHF= Congestive Heart Failure

outperformed the other five in her study, had a strong organizational foundation of a quality improvement culture and strong physician leadership. Also Bodenheimer [17] concluded that visionary clinical leadership and financial conditions are needed for successful improvements in chronic care.

Table 4. Included performance dimensions (A and B level studies)

Study	**Clinical results/ QoL**	**Efficiency results***	**Worker/professional results**	**Customer results****	**Financial results**
Bodenheimer et al., 2002 (17)	+	+	–	–	+
Tsai et al., 2005 (16)	+	+	–	–	–
Piatt et al., 2006 (18)	+	–	–	+	–
Benedetti et al., 2004 (32)	+	+	+	–	–
Chumbler et al., 2005 (33)	–	+	–	–	–
Mangione et al., 2005 (34)	+	+	–	+	–
Schonlau et al., 2005 (35)	+	+	–	+	–
Feifer et al., 2001 (36)	+	+	–	–	–

* service use (clinical exams, protocols followed, length of stay etc.)

** satisfaction, knowledge, empowerment

QoL=Quality of Life

Discussion and conclusion

Our finding in this review was that there is weak evidence for improved performance by implementing interventions based on the EFQM or MBQA models elements in health care settings. No randomized or controlled studies were found. The small number of EFQM/MBQA studies is surprising, because these models are widespread and have been used for many years. For the Chronic Care Model, the studies used more solid designs and methods. Some evidence has been found that implementing interventions based on the Chronic Care Model improves performance, but the conclusions are all drawn in USA settings for specific patient groups. Considering the quality of the studies, the description of the implemented interventions was often limited. For the EFQM/MBQA studies, the data in the multiple case studies were not systematically measured over time, making statements on improved performance impossible. An explanation for these differences found may lie in the origin of the models and their use in practice. The

EFQM/MBQA models are 'experience-based', while the Chronic Care Model is build 'evidence-based'. The data in the EFQM and MBQA studies were mainly gathered from improvement projects, instead of research projects designed for statistical testing. The Chronic Care Model studies focus merely on patient groups and clinical measures, which better 'fit' the more biomedically oriented scientific research paradigm of controlled (randomized) trials.

Although the models have different origins, some elements show similarities. Interventions on 'clinical information systems' in the Chronic Care Model correspond to interventions in the EFQM 'resources' element. Shifts in care processes or tasks of workers both fit in Chronic Care Model's 'delivery system design' and EFQM/MBQA's 'processes' and 'people'. Although the Chronic Care Model pays attention to aspects such as leadership (within 'health care organization'), these elements combined with health policy are more emphasized in the EFQM/MBQA models. On the other hand, the Chronic Care Model defines 'self-management' as a crucial element, while the EFQM/MBQA do not. It would appear that the EFQM/MBQA models are mainly used as management tools, e.g. at strategic level, whereas the Chronic Care Model is mainly used as a tool to optimize care for a specific patient group at the more operational or process level. Comments made on the Chronic Care Model include the fact that aspects like culture, leadership and a greater business focus are missing [37], while the EFQM/MBQA is sometimes said not to provide a sufficient 'health care fit' [6].

Regarding to integrated care, the studies focussed merely on just one organization. In the study by Shortell et al. [49] regarding the impact of quality improvement on clinical practice, no studies focusing on the continuum of care were found. Some studies however addressed the need for integrated care and management of the total care process. Freer and Jackson [25] stressed the helpfulness of the MBQA program for integrating services, while Chumbler et al. measured inpatient and outpatient clinic outcomes to stress the interrelatedness for diabetic patients [33]. Although 'the community' enabler in the Chronic Care Model points out relationships with other (care and welfare) organizations, integrated care chains are not the domain subjects of study. With regard to the increasing numbers of chronically ill and the need for integrated care, further development of these models is required in terms of both their usefulness and their applicability to care chains.

No studies covered more than three performance dimensions. With the attention to costs and efficiency in current health, it is surprising that only a few Chronic Care Model studies measured financial performances. Moreover, measures of worker satisfaction (the care team) and patient judgements are also often lacking. The assessment procedures used in the EFQM/MBQA studies include multiple performance dimensions, but information about the results on these dimensions is often not systematically reported.

The EFQM/MBQA studies paid more attention to the influence of context factors than the Chronic Care Model studies. As known from the literature, organizational characteristics such as culture and leadership and political developments affect the results [50, 51]. The included studies conform this by naming these factors as influencing factors. For the EFQM/MBQA models there are also studies in other sectors available. These studies show mixed but mostly positive results. Kaynak [52] found 18 studies on the relationship between Total Quality Management implementation and improved performance, all of which showed one or more positive effects. A recent controlled study by Boulter et al. [53] found evidence that the 120 award-winning companies experienced a greater increase in shared values, capital expenditure, growth in assets and reduction in costs over both short and long periods of time. Summarized, the results indicate that effective implementation of the EFQM model makes good economic sense in non-health care settings. Another interesting issue is how organizations develop in increasing performance. Both the EFQM/MBQA models and the Chronic Care Model have five 'development phases' that suggest pathways for growth [6, 8, 9]. The assumption is that improved performance is related to growth in the developmental phase. In this perspective, insight into the relationship between interventions, organizational development and performance is interesting but is yet hardly a subject of research.

Our research contains several limitations. There is a lack of insight as to which models elements contribute the most to performance and to which confounding and context variables are present. Furthermore, the effects of collaborative improvement-program interventions are not separated out when assessing the results. Another limitation concerns the methodological quality of the studies. The interventions differ from one study to another, meaning that generalizations are hazardous and that the findings are not reproducible for larger populations or other organizations. The absence of publication bias cannot be guaranteed. Also, we conducted a search for studies in which reference was made to the use of the model, while other studies that might have implemented comparable interventions were not included. Finally, Grol [54] and Øvretveit and Gustafson [55] stress the complexity of solid research designs given the large number of possible interacting dimensions, making it difficult to prove firm relationships. The richness of interventions, confounding variables and effects of organizational development mean that the evidence for relationships between using the model as a whole and performance largely remains a grey area.

Despite these caveats, this review does support the conclusion that interventions based on the Chronic Care Model, may improve process and outcome measures in some situations. For the EFQM/MBQA the evidence found is less strong. Future research should pay special attention to the use and effects of the models in integrated care settings and to balanced measurement of multiple performance dimensions. Next to this, more knowledge on the relationship between organizational development, context factors and improved performance is needed. Both models have possibilities for the further development of practical and evidence-based tools for improving integrated care.

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Chapter 5

A quality management model for integrated care: results of a Delphi and Concept Mapping study

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Abstract

Objective

The objective of this study is to identify the elements and clusters of a quality management model for integrated care.

Method

In order to develop the model a combination of three methods were applied. A literature study was conducted to identify elements of integrated care. In a Delphi study experts commented and prioritized 175 elements in three rounds. During a half-day session with the expert panel, Concept Mapping was used to cluster the elements, position them on a map and analyse their content. Multidimensional statistical analyses were applied to design the model.

Participants

Thirty-one experts, with an average of 8.9 years of experience working in research, managing improvement projects or running integrated care programmes.

Results

The literature study resulted in 101 elements of integrated care. Based on criteria for inclusion and exclusion, 89 unique elements were determined after the three Delphi rounds. By using Concept Mapping the 89 elements were grouped into nine clusters. The clusters were labeled: 'Quality care', 'Performance management', 'Interprofessional teamwork', 'Delivery system', 'Roles and tasks', 'Patient-centeredness', 'Commitment', 'Transparent entrepreneurship' and 'Result-focused learning'.

Conclusion

The identified elements and clusters provide a basis for a comprehensive quality management model for integrated care. This model differs from other quality management models with respect to its general approach to multiple patient categories, its broad definition of integrated care and its specification into nine different clusters. The model furthermore accentuates conditions for effective collaboration such as commitment, clear roles and tasks and entrepreneurship. The model could serve evaluation and improvement purposes in integrated care practice. To improve external validity, replication of the study in other countries is recommended.

Introduction

Over the past decade the integration of care has gained increasing attention from managers, health care workers, policymakers and researchers in many countries as a strategy to improve health care delivery [1-4]. Integrated care refers to a coherent and co-ordinated set of services, which are planned, managed and delivered to individual service users across a range of organisations and by a range of co-operating professionals and informal carers [3]. The focus on integrated care stems from the growing fragmentation and supply-oriented approach in health care, which resulted in discontinuity, duplication and an absence of responsibility for the whole continuum of care. There is a widespread belief that integration of care is necessary to respond to these deficiencies and that integration will enhance client satisfaction, quality of life, efficiency and outcomes and will decrease costs [5-8]. Integrated care appears in a variety of forms such as 'shared care', 'continuing care', 'disease management', 'transmural care', 'comprehensive care' or 'intermediate care', and is required when the services of separate agencies and individual professionals do not cover all the demands of multiple-problem clients [3, 9].

Though widely acknowledged and pursued, the development of integrated care has proven to be a difficult task. Developers struggle with the question as to which elements are essential for realising, improving, innovating and sustaining integrated care. Although much research has been done on integrated care, the studies address specific settings or patient groups and have partially incompatible conclusions [10]. A review of 31 disease management studies showed routine reporting and feedback loops, evidence-based guidelines, collaborative practice models and process and outcome measurement as the most frequently implemented elements. These results are however only based on programmes for patients with asthma and/ or diabetes mellitus [11]. Another review of integrated care programmes reported the elements of self-management support, clinical follow-up, case management, feedback and education, multidisciplinary care teams and care pathways [12]. The Chronic Care Model (CCM), which describes elements associated with better care outcomes for chronically ill patients, names the elements of community, the health system, self-management support, delivery system design, decision support and clinical information systems as essential ingredients [13, 14].

Evidence-based or expert-based quality management models can support quality improvements in health care. A quality management model is defined as a model for a structured, systematic process for creating organisation-wide participation in the planning and implementation of continuous quality improvement [15]. However present in health care, quality management models do not have integrated care as the dominant focus. The frequently used expert-based EFQM Excellence model primarily focuses on the level of the organization, while for integrated care interorganisational collaboration is essential [16]. The Dutch version of the EFQM Excellence model does define five developmental phases of organizational growth, with the fourth phase defined as 'chain-oriented'. However, a further refinement of activities or elements within this developmental phase remains unexplored [17]. The evidence-based CCM focuses on care coordination within and across organizations in its 'health care organization' component, but the overall model has the levels of the community, the organization, practice and the patient as its focal point [13, 14].

The lack of a consistent set of elements and a generic quality management model for integrated care provides the mainspring for this study. The aim is to assemble knowledge on elements of integrated care and to construct a generic quality management model for integrated care, based on these elements, that covers multiple patient groups and integrated care settings. The research questions are: 1. What are important elements for developing (realizing, improving, innovating and sustaining) integrated care? 2. How can these elements be logically grouped and labeled in order to construct a quality management model for integrated care?

Method

In order to develop the quality management model in a systematic way, a combination of literature study, Delphi methodology and Concept Mapping was applied. In this way evidence-based and expert-based knowledge was combined in order to achieve full richness of the model. The use of qualitative and quantitative (statistical) analyses is a sound base for generating empirical conceptual frameworks of complex concepts [18].

Literature study

A literature study on elements of integrated care was performed in order to make use of the available knowledge and international perspectives. An element of integrated care was defined as an activity focusing on the development (realization, improvement, innovation or sustainability) of integrated care, based on the quality continuum of Feussner et al. [19] The Pubmed and Cochrane databases were searched on recent reviews (1997- February 2007) in English or Dutch with search terms "integrated care", "shared care", "coordinated care", "disease management", "transmural care", "comprehensive care" or "intermediate care" and (quality) model. To include multiple sources doctoral theses, evaluation reports and frequently used quality management models were also studied [1, 2, 4-7, 10-14, 20-31]. To ensure that the list of elements was sufficient three steps were taken. Firstly, the research team reviewed the list of included literature. Secondly, the list of elements was reviewed and refined in multiple rounds by three researchers experienced in integrated care research until consensus was reached on the elements and each element description. Lastly, before entering the Delphi study the list of elements was reviewed by two experienced integrated care project leaders in order to optimize content validity.

Delphi study

A Delphi study was carried out to improve, complete and restrict the list of elements from the literature study [32, 33]. A Delphi study is a robust method that uses expert judgments, and compares these judgments in several rounds with the aggregate judgments of other participating experts, until consensus on prespecified criteria is reached [34]. The experts were selected on: multiple years of experience with integrated care, experience with multiple and different patient groups or integrated care settings, and expert knowledge based on research, implementation projects or practice experience. We generated a list of Dutch experts by tracking publications, conferences on integrated care, national networks and suggestions of contacted experts. Before approaching each expert we sought to strike a balance between expertise and dominant background in the total group. Eventually, out of the 35 approached experts 31 persons agreed to participate (see table 1 for characteristics). Thereby, recommended panel size of 30 participants was reached [35]. The four rejections were all due to unavailability as people were on leave. All the experts received information about the aim of the study and the Delphi procedure.

Table 1. Characteristics of Delphi panel experts

Characteristics	Category	Expert group N= 31
Gender	Male	42 %
	Female	58 %
Age (years)	Min – Max	27 – 63
	Average (sd)	44.71 (9.13)
	< 40	26 %
	40 – 50	52 %
	>50	22 %
Years of experience	Min – Max	2 – 25
	Average (sd)	8.89 (5.48)
	< 5	19 %
	5 – 10	55 %
	> 10	26 %
Source of expertise	Research	13 %
	Research & practice	3 %
	Implementation programmes	29 %
	Research & impl. programmes	26 %
	Practice	3 %
	Practice & impl. programmes	26 %
Dominant background	Professional	52 %
	Organizational/ health sciences	48 %

The experts were consulted in three anonymous Delphi rounds. Each time the experts received an Excel sheet with the elements by e-mail with the instruction to rate the importance of each element for developing integrated care. Response categories were: Not important (0), moderately important (1), important (2) and very important (3). This Likert rating scale was used to avoid a tendency to score 'in the middle'. The second question was: 'Do you have suggestions to reformulate this element?' In addition, the experts had the opportunity to add new elements. As conferred with methodologists, an element was included after each round if more than 80% of the experts judged it as important or very important, and excluded if more than 50% judged an element as not or moderately important. The rationale for the cut-off scores was firstly to be certain of keeping an element with have a high agreement on importance (>80%). Secondly, to be cautious about eliminating an element (>50%) so as not to miss a topic and thirdly to make sufficient use of the option of reformulation. The suggested reformulations were analysed individually by the three researchers and reformulated on the basis of consensus between them. These reformulated items were presented in the next round together with the new and unchanged elements, while showing the average group percentage that had scored important/very important in the previous round.

This Delphi procedure delivered a final list of elements for the design of a quality management model for integrated care.

Concept Mapping

The elements resulting from the Delphi study were used as input for a Concept Mapping session with the same expert panel (only one person was not available). Concept Mapping is an exploratory consensus procedure for modeling conceptual frameworks based on specific elements, and was developed by Trochim [36]. The procedure is highly structured and combines experts' sorting techniques with multidimensional scaling and cluster analyses [37]. The statistical procedures were fixed as an algorithm of the computer program ARIADNE, version 2.0. The systematic stepwise approach and the statistical analyses contribute to a high internal validity of the generated cluster maps [37, 38].

During the session each expert was asked to individually cluster the elements (with a maximum of 12 clusters) and gave names to the clusters. The cluster exercise was supported by a computerized groupware system (Meetingworks 6.5), in which each expert had his/her own laptop with a prepared sheet. The data generated by the 30 experts were stored in a database and used for the statistical procedure, which was carried out by ARIADNE in three steps [39].

Firstly, the point map was calculated by using multidimensional scaling. The scaling procedure positioned each element on a two-dimensional map with four poles. Elements which are located close to each other carry a similar meaning, whereas elements far apart from each other are not related. Secondly, the coordinates of the point map where used to conduct hierarchical cluster analyses. After reviewing several cluster maps by following the recommended procedure [36], the nine cluster solution represented the conceptual framework best. The third step was the labeling and the description of the clusters. The 30 experts were divided into nine groups based around 'background' and 'years of experience'. Each group discussed one cluster, analysed the elements and generated a cluster label and description for the cluster. The findings were discussed in plenary. To analyze similarities or differences between panel subgroups, additional principal component analyses were calculated.

Results

Literature and Delphi study

The literature study resulted in 101 elements and revealed an emphasis on organisational aspects such as agreements on patient logistics, protocols, coordinative interventions and information flows. During the three Delphi rounds, no experts were lost, resulting in a response rate of 100% in each round (table 2). During each round, approximately half the elements were included, leaving the others excluded or presented (reformulated) for the next round. In the first round 17 out of 38 suggested new elements were inserted for round two on account of duplicate suggestions or elements already existing in the first set. In the second round four new elements were suggested, and none in the final round. Only a small percentage of the elements (range 2% - 6%) were classified as 'not important'. The average number of reformulated suggestions varied per expert, and decreased over the three rounds. Eventually 89 elements were included, with a priority score of between 1.79 and 2.94 (see table 3).

Table 2. Delphi panel results

	ROUND 1	**ROUND 2**	**ROUND 3**
Response (n=31)	100%	100%	100%
Elements (numbers)	101	49	25
– Included	– 51% (52)	– 53% (26)	– 44% (11)
– Excluded	– 17%	– 4%	– 56%
– Rephrased	– 24%	– 27%	– 0
– Unchanged	– 8%	– 16%	– 0
New elements	17	4	0
Priority	3131 scores	1519 scores	775 scores
– Very important	– 30%	– 26%	– 25%
– Important	– 44%	– 52%	– 50%
– Moderately important	– 20%	– 20%	– 23%
– Not important	– 6%	– 2%	– 2%
New elements (total)	38	8	3
– average/expert (sd)	1.23 (1.50)	0.26 (0.82)	0.10 (0.54)
– min - max	0 – 5	0 – 4	0 – 3
Reformulation suggestions (total)	292	68	40
– average/expert (sd)	9.42 (12.71)	2.19 (3.00)	1.29 (2.58)
– min – max	0 – 56	0 –12	0 – 13

Table 3. Nine cluster description and their elements

Cluster 1. Patient-centeredness, 9 elements, average Priority Score (PS) 2.23, sd 0.22

PS	SD	Rank	Nr	Element description
2.66	0.60	4	40	Providing understandable and client-centered information
2.36	0.84	27	3	Collaboratively offering client information of the care partners
2.35	0.66	30	86	Designing care for clients with multi- or co-morbidities
2.31	0.75	35	68	Using self-management support methods as a part of integrated care
2.23	0.76	43	14	Implementing care process-supporting clinical information systems
2.13	0.62	63	84	Flexible adjustment of integrated care corresponding to individual clients' needs
2.10	0.75	67	1	Developing a front office: single entry point for client information
1.97	0.48	83	74	Using a protocol for the systematic follow-up of clients
1.94	0.57	86	78	Developing care programmes for relevant client subgroups
Cluster description				This cluster is about developing integrated care and information flows tailored to specific (sub)groups of patients. Elements focus on integrated patient and care process supporting information such as front offices, self-management support or information systems, and delivering care adjusted to individual needs (e.g. multi-morbidity).

Cluster 2. Delivery system, 18 elements, average priority score 2.26, sd 0.32

PS	SD	Rank	Nr	Element description
2.94	0.25	1	2	Reaching agreements on referrals and transfer of clients through the care chain
2.84	0.45	2	4	Reaching agreements on procedures for information exchange
2.71	0.53	3	17	Using a single client-monitoring record accessible for all care partners
2.46	0.62	14	69	Reaching agreements on procedures for the exchange of client information
2.42	0.76	18	10	Developing connections between databases of partners in the care chain
2.38	0.66	25	6	Offering case management for clients with complex needs
2.32	0.48	33	20	Reaching agreements on chain logistics (e.g. waiting periods and throughput times)
2.32	0.70	34	27	Using shared client treatment and care plans

Cluster 2. (Continued)

2.26	0.73	40	23	Using uniform client-identification numbers within the care chain
2.19	0.73	47	9	Reaching agreements among care partners on the consultation of experts and professionals
2.07	0.63	69	7	Reaching agreements among care partners on managing client preferences
2.06	0.77	73	30	Reaching agreements among care partners on scheduling client examinations and treatment
2.05	0.75	74	32	Reaching agreements among care partners on discharge planning
2.00	0.68	80	21	Developing criteria for the inclusion and throughput of clients in the care chain
1.97	0.60	82	24	Reaching agreements among care partners on providing care to waiting-list clients
1.95	0.71	84	15	Bringing specialized nurses into action through the care chain
1.94	0.57	85	26	Reaching agreements on linking clients to outside resources or community care partners
1.79	0.65	89	34	Developing criteria for assessing clients' urgency
Cluster description				Chain and client logistics, coordination mechanisms and procedures for streamlining the care process for the whole care chain is the main focus of this cluster. The reaching of all agreements (e.g. logistics, sharing expertise), procedures (e.g. information exchange) or tools (e.g. care plans) in the care chain that are necessary from the client's initial entry into the care chain until the final contact are reflected in this cluster.

Cluster 3. Performance management, 16 elements, average priority score 2.32, sd 0.14

PS	SD	Rank	Nr	Element description
2.55	0.57	9	12	Defining performance indicators to evaluate the results of the integrated care delivered
2.50	0.63	12	13	Providing feedback to care partners on transfers
2.44	0.67	15	55	Gathering client-related performance data (health status, quality of life)
2.42	0.50	19	53	Gathering data on client logistics (e.g. volumes, waiting periods and throughput times) in the care chain
2.41	0.76	20	31	Using feedback and reminders by professionals for improving care
2.40	0.62	23	82	Reaching agreements about the uniform use of performance indicators in the care chain

Cluster 3. (Continued)

2.39	0.56	24	24	Monitoring successes and results during the development of the integrated care chain
2.33	0.60	31	31	Establishing quality targets for the performance of the whole care chain
2.32	0.48	32	32	Monitoring and analyzing mistakes/near mistakes in the care chain
2.27	0.59	38	38	Using a systematic procedure for the evaluation of agreements, approaches and results
2.25	0.63	42	42	Monitoring client judgements and satisfaction for the whole care chain
2.23	0.72	45	45	Gathering financial performance data for the care chain
2.19	0.65	48	48	Making transparent the effects of the collaboration on the production of the care partners
2.19	0.65	50	50	Monitoring whether the care delivered corresponds with evidence-based guidelines
2.18	0.58	53	53	Establishing quality targets for the performance of care partners
1.98	0.63	81	81	Installing improvement teams at care-chain level
Cluster description				Measurement and analyses of the results of the care delivered in the care chain is the central theme of this cluster. Elements address performance targets at all levels, monitored by the standardized use of indicators. Indicators address client outcomes, client judgments, organizational outcomes and financial performance data. (Near) mistake analysis, feedback mechanisms and improvement teams are used to improve and manage the level of performance

Cluster 4. Quality care, 5 elements, average priority score 2.43, sd 0.20

PS	SD	Rank	Nr	Element description
2.65	0.49	5	76	Systematically assessing the needs of the clients in the care chain
2.55	0.57	8	11	Developing a multidisciplinary care pathway
2.43	0.57	16	45	Involving client representatives in improvement projects in the care chain
2.40	0.62	21	8	Using evidence-based guidelines and standards
2.12	0.60	64	60	Involving client representatives by monitoring the performance of the care chain

Cluster 4. (Continued)

Cluster description	This cluster contains elements that focus on the design of a multidisciplinary care pathway throughout the care chain, based on evidence-based guidelines and standards and clients' needs and preferences. A needs assessment of the specific client group is required for this purpose, combined with the involvement of client representatives in designing, improving and monitoring the integrated care.

Cluster 5. Result-focused learning, 12 elements, average priority score 2.16, sd 0.13

PS	SD	Rank	Nr	Element description
2.37	0.62	26	46	Stimulating a learning culture and continuous improvement in the care chain
2.27	0.73	37	38	Defining and assessing the characteristics of the collaboratively delivered care
2.26	0.77	41	57	Making transparent the benefits of the collaboration for each care-chain partner
2.23	0.76	44	16	Collaboratively assessing bottlenecks and gaps in care
2.17	0.70	55	83	Sharing knowledge among care partners about effectively organizing sustainable integrated care
2.16	0.69	58	71	Striving towards an open culture for discussing possible improvements for care partners
2.14	0.73	60	66	Learning by the exchange of information among professionals about the care process
2.13	0.62	61	72	Integrating incentives for rewarding the achievement of quality targets
2.11	0.85	65	52	Using knowledge and information for directing and coordinating the care chain
2.11	0.50	66	88	Using collaborative education programmes and learning environments for the professionals of care partners
2.03	0.55	79	58	Linking consequences to the achievement of agreed goals
1.88	0.47	88	70	Collaborative learning in the care chain in order to innovate integrated care
Cluster description				A learning climate of striving towards continuously improved results in the care chain is this clusters central theme. The elements address essential ingredients for improvement: defining goals for collaboration, identifying bottlenecks and gaps in care, and ways of learning and exchanging knowledge in an open atmosphere. Incentives are used to reward improved performance.

Cluster 6. Interprofessional teamwork, 3 elements, average priority score 2.30, sd 0.29

PS	SD	Rank	Nr	Element description
2.61	0.50	6	42	Defining the targeted client group
2.26	0.73	39	18	Working in multidisciplinary teams
2.04	0.80	76	28	Reaching agreements on the availability and accessibility of professionals
Cluster description				This cluster represents interprofessional teamwork for a well-described client group. The defined client group is the target to be reached by collaborating professionals, working in well-organized multidisciplinary teams in the care chain.

Cluster 7. Roles and tasks, 8 elements, average priority score 2.26, sd 0.20

PS	SD	Rank	Nr	Element description
2.55	0.57	10	22	Reaching agreements among care partners on tasks, responsibilities and authorizations
2.55	0.57	11	63	Achieving adjustments among care partners by means of direct contact
2.36	0.61	29	44	Ensuring that professionals in the care chain are informed of each other's expertise and tasks
2.20	0.79	46	87	Installing a coordinator working at chain-care level
2.18	0.58	52	39	Establishing the roles and tasks of multidisciplinary team members
2.13	0.67	62	75	Realizing direct contact among professionals in the care chain
2.07	0.63	72	81	Reaching agreements on introducing and integrating new partners in the care chain
2.05	0.75	75	43	Directing the care chain by appointing a limited number of persons with coordinating tasks
Cluster description				The need for clarity about each other's expertise, roles and tasks in the care chain is reflected in this cluster. Effective collaboration at all levels, with new partners and by allocating coordinating roles are the main components.

Cluster 8. Commitment, 11 elements, average priority score 2.20, sd 0.18

PS	SD	Rank	Nr	Element description
2.49	0.63	13	35	Defining the ambitions and aims of the collaboration in the care chain
2.43	0.57	17	47	Signing collaboration agreements among care partners
2.40	0.62	22	54	Assuring the leadership commitment of the partners involved to the care chain
2.29	0.53	36	79	Describing the tasks and authorities of leaders, coordinators and advisory boards in the care chain
2.19	0.82	49	56	Establishing dependencies among care partners
2.17	0.86	54	36	Guiding the care chain by emphasizing a collaborative commitment
2.16	0.73	56	62	Structural meetings of leaders of care-chain organizations
2.08	0.79	68	85	Reaching agreements about letting go care partner domains
2.07	0.68	70	25	Stimulating trust among care partners
2.04	0.80	77	48	Stimulating the awareness of working in a care chain
1.91	0.60	87	80	Structural meetings with external parties such as insurers, local governments and inspectorates
Cluster description				This cluster's focus is on collaborative commitment and ambition in the care chain. Commitment towards clearly defined goals and a collaborative ambition, apart from awareness of dependencies and domains. The commitment of leaders to the care chain and the awareness of working in a care chain are also components.

Cluster 9. Transparent entrepreneurship, 7 elements, average priority score 2.22, sd 0.19

PS	SD	Rank	Nr	Element description
2.59	0.62	7	50	Making commitment to a joint responsibility for the final goals and results to be achieved
2.36	0.61	28	33	Using a uniform language in the care chain
2.19	0.65	51	65	Reaching agreements on the financial budget for integrated care
2.16	0.64	57	64	Allocating financial budgets for the implementation and maintenance of integrated care
2.14	0.78	59	37	Involving leaders in improvement efforts in the care chain
2.07	0.68	71	73	Creating an open environment that encourages experiments and pilot projects

Cluster 9. (Continued)

2.04	0.80	78	77	Offering a single collaborative financial contract to financing parties by the collective of care partners
Cluster description				This cluster concentrates on space for innovation (experiments), leadership responsibilities for performance achievement and joint financial agreements covering the integrated care. Preconditions for entrepreneurship, including financial preconditions, are represented in the collection of elements.

Table 3: Nine cluster description and their elements.
Per element an average group priority score (PS), standard deviation (SD) and rank number (within 89 elements) are presented. Nr refers to the original element numbers is given which correspond with figure 1.

Concept Mapping

The first analytical step resulted in a two-dimensional point map with the elements positioned in a circumplex structure shape, with no elements in the centre of the map and a majority of the elements positioned on the west and south-eastern poles. The hierarchical cluster analyses and review of the cluster maps resulted in a nine-cluster representation (figure 1). The additional analyses of sort similarities between experts finally showed values of between 0.64 and 0.87 (average 0.75), representing a high similarity in clustering. Further analyses of correlations between two panel subgroups (research-experience or not and professional background or not) also showed high correlations (0.83 research – no research, 0.84 professional – not professional), which indicate that these characteristics did not influence the results significantly.

Based on the (sub)group discussions the labels of the clusters were defined as: 'Quality care', 'Performance management', 'Interprofessional teamwork', 'Delivery system', 'Roles and tasks', 'Patient-centeredness', 'Commitment', 'Transparent entrepreneurship' and 'Result-focused learning'. Average priority scores per cluster range from 2.43 ('Quality care', sd 0.20) to 2.16 ('Result-focused learning', sd 0.13). The nine clusters with their elements are described in table 3.

A next step in the concept mapping procedure was the analyses of the cluster map to define the four poles. This analyses of the clusters' content and their positions on the map by three researchers resulted in the following poles: 'Effective collaboration'; 'Organisation of care'; 'Quality care' and 'Results'. The more northern clusters on the map broadly correspond with the operational level in integrated care (like 'providing client-centered information'), and the more southern clusters with the strategic level in integrated care settings (e.g. 'signing collaboration agreements').

The elements with the highest priority scores mainly cover organizational aspects of client-focused integrated care. No elements from the 'Result-focused learning' and 'Commitment' clusters are in the top ten priority scores.

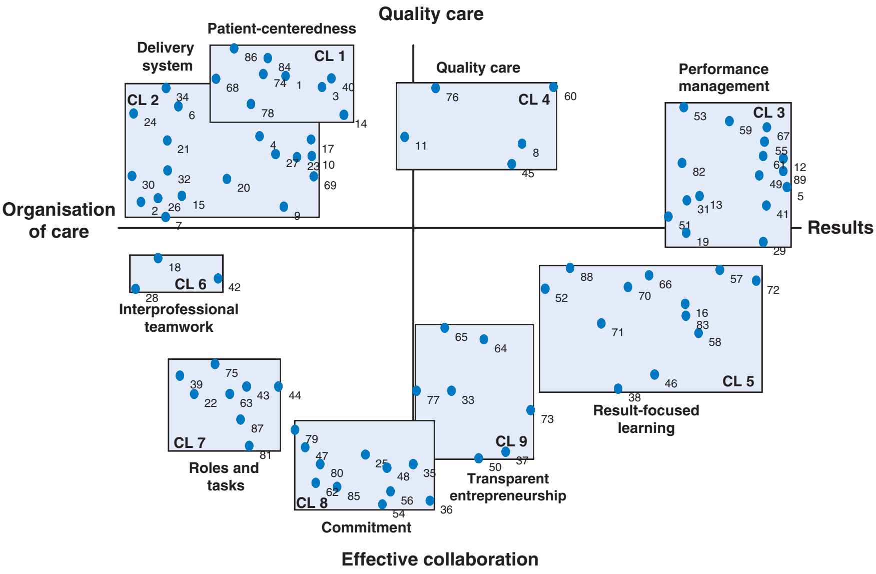

Figure 1. Conceptual representation : Integrated Point and Cluster Map

Discussion

Reflection on the study and study limitations

It proved to be a useful strategy to combine the results of a literature study, a Delphi procedure and Concept Mapping to construct a basis for a quality management model on integrated care. In accordance with Franklin and Hart [33] we found that starting from a list of elements extracted from the literature instead of a blank sheet proved to be an efficient approach during the Delphi rounds. It provided a point of origin for the experts and limited the randomness of an open-ended dialogue. Most elements were confirmed and the number of new added elements was limited and saturated after three rounds. Content review of excluded elements by three of the researchers also showed that these elements were less specific than related existing ones or were addressed as 'softer' subjects such as cultural aspects (e.g. 'developing an own integrated care culture with shared values').

The study has some limitations. One limitation is that the nature of the literature study and the use of expert knowledge cannot fully guarantee that no elements are missed. The expert panel included leading experts with wide and also international experience, which contributed to a broad range of aspects of the complex topic. Furthermore, the convergence of opinion, necessary to assess whether a Delphi study is 'complete', was satisfactory. To take into account that the experts may have been influenced by the prepared list of elements, they were allowed to submit new elements in every round. Another limitation for the external validity is the use of a national expert panel. Contextual factors like the type of health care system, social values, health reform, the history of quality and the language and politics of quality will have influenced the results [40].

Comparison with other quality management models

Our model exhibits interesting similarities with the EFQM and the CCM, although both models were developed in different contexts and use different methods. In our view, the 'Processes' and 'Personnel' clusters of the EFQM and the 'Delivery system design' and 'Clinical information systems' clusters of the CCM overlap with our 'Delivery system', 'Interprofessional teamwork' and 'Roles and tasks' clusters. In addition all three models pay attention to results, whereas the EFQM defines four result areas and the CCM ('improved outcomes') and our model ('performance management') define one cluster with several outcome categories. Somewhat different is our cluster 'Result-focused learning'. Whereas 'Learning and innovation' is included in the EFQM, it is not a cluster. The CCM names 'Productive interactions', but this is in between a 'Prepared proactive care team' and 'Informed and activated patients'. The stronger focus on development and learning in our model could reflect the continuous development of many integrated care programmes nowadays [3, 28]. Another difference concerns 'Transparent entrepreneurship', a cluster concerning the balance between competition and cooperation in health care and the need for entrepreneurship and innovation. This is not explicitly included in either the EFQM or the CCM; the description of the Regional Framework of the CCM does however touch upon this issue [41]. Further differences are seen in a stronger focus on effective collaboration (commitment, roles and tasks) and conditions for integrated care.

Practical and research implications

The dedication of the experts during the study and the response rates of 100% can be seen as an indication of the study's relevance. Firstly, this refers to a practical relevance. The clusters and elements of the concept map can be used as an evaluation framework to assess integrated care practices. As such the model may serve as a management tool to identify which elements are present, and where and how these practices can be improved.

Secondly, this study contributes to theory building. The study adds value because it generates a conceptual model of an important and complex concept, by identifying elements of it and bringing them together in clusters. The Delphi study and Concept Mapping methods suit the explorative research questions. A recommendation for further research is to conduct more empirical studies to validate the model in real practice. The external validity could be improved by replication of the study in other countries and healthcare systems. A second recommendation is to add additional perspectives, for instance by involving patient representatives. Thirdly, additional research is recommended into the development process of integrated care. Many countries struggle with the same issues when it comes to developing integrated care arrangements [8, 21]. The literature on integrated care and quality management models like the Dutch version of EFQM and CCM describe phases of development. More research is needed to explore these phases of development further in order to add these to the model developed in this study.

Conclusion

The goal of our study was to develop a basis for a quality management model for integrated care. Based on 89 elements which were developed in a literature and Delphi study with 31 experts, a nine-cluster model was created by using Concept Mapping. The nine clusters are 'Patient-centeredness', 'Delivery system', 'Performance management', 'Quality care', 'Result-focused learning', 'Interprofessional teamwork', 'Roles and tasks', 'Commitment' and 'Transparent entrepreneurship'. These have been located on a map with the poles of 'Effective collaboration', 'Organisation of care', 'Quality care' and 'Results'. Compared with other frequently used quality management models there is some overlap, but features of integrated care such as effective cooperation and commitment get more emphasis in our model. Whereas the internal validity of the model is believed to be sufficient, the external validity needs to be confirmed by replication and empirical validation.

The cluster map is the empirical basis for the quality management model and covers a broad range of aspects of integrated care. The model has the potential to serve evaluation and improvement purposes in integrated care practice. This study also contributes to theory building on integrated care by analyzing this complex concept in elements and bringing them together in clusters by experts. For the last 20 years, integrated care has emerged as an internationally important topic. The continuous improvement of integrated care is a challenge of vital importance. This study is a step towards a systematic approach to do so and it is an invitation to others to increase knowledge on improving the quality of integrated care.

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Chapter 6

A four phase development model for integrated care services in the Netherlands

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A four phase development model for integrated care services in the Netherlands

Abstract

Background

Multidisciplinary and interorganizational arrangements for the delivery of coherent integrated care are being developed in a large number of countries. Although there are many integrated care programmes worldwide, the process of developing these programmes and interorganizational collaboration is described in the literature only to a limited extent. The purpose of this study is to explore how local integrated care services are developed in the Netherlands, and to conceptualize and operationalize a development model of integrated care.

Methods

The research is based on an expert panel study followed by a two-part questionnaire, designed to identify the development process of integrated care. Essential elements of integrated care, which were developed in a previous Delphi and Concept Mapping Study, were analyzed in relation to the development process of integrated care.

Results

Integrated care development can be characterized by four developmental phases: the initiative and design phase; the experimental and execution phase; the expansion and monitoring phase; and the consolidation and transformation phase. Different elements of integrated care have been identified in the various developmental phases.

Conclusions

The findings provide a descriptive model of the development process that integrated care services can undergo in the Netherlands. The findings have important

implications for integrated care services, which can use the model as an instrument to reflect on their current practices. The model can be used to help to identify improvement areas in practice. The model provides a framework for developing evaluation designs for integrated care arrangements. Further research is recommended to test the developed model in practice and to add international experiences.

Background

Integrated care programmes are being developed in countries all over the world in order to reduce fragmentation in care and to improve clinical outcomes, quality of life, patient satisfaction, effectiveness (use of evidence-based guidelines) and efficiency or reduce costs [1, 2]. Integrated care is defined as a coherent and co-ordinated set of services which are planned, managed and delivered to individual service users across a range of organizations and by a range of co-operating professionals and informal carers [3]. Developing integrated care services is complex. Arranging streamlined patient flows, establishing partnership relationships among health care organizations and linking planning and information systems are some examples of activities within these complex processes. Although there are many integrated care programmes worldwide, the process of developing these programmes and such interorganizational collaboration is described in the literature to only a limited extent [3, 4, 5]. In related areas, like the development of organizations, a body of literature is available. Interesting questions are therefore how the development process of these programmes can take place in practice and what activities can characterize these developmental processes over time. We first review some of the main literature in three related areas: organizational development, the development of networks, and quality management models in health care based on assumptions concerning the development of organizations or networks to improve performance. We focus on how the development processes are described and with what characterizing features.

Organizational development

Since the late 1960s there have been a number of publications about organizational development [6 - 12]. These authors suggest that the development and behavior of organizations can be predicted by means of organizational life-cycle models according to which changes in organizations follow a predictable pattern involving developmental stages. Most authors suggest three to five sequential stages, sometimes in parallel with natural growth stages such as birth, youth and maturity. Greiner [7] developed one of the earliest models in the private sector and defined six phases of growth, each followed by a revolution or transitional phase arising from a major organizational problem. The sixth phase later added refers to extra-organizational solutions like alliances, networks or mergers of organizations. D'Aunno and Zuckermann [12] describe a four-phase life-cycle model for federations in health care. Federations are defined as interorganizational collaboration by at least two membership organizations, guided by a management group. Based on earlier life-cycle models, they define four phases: 'emergence of a coalition', 'transition to a federation', 'maturity of the federation' and 'critical crossroads'. For each stage they define two key factors and examples of tasks such as 'defining the goal of the coalition' in the first stage. Because empirical evidence for the model is lacking, the authors suggest testing some hypotheses. Although there may appear to be consensus about life-cycle thinking, Phelps [13] points out the limits of life-cycle models. According to Phelps there is an absence of consensus about the number of phases, phase characteristics and phase definitions. Moreover, the assumption that organizations do experience life cycles is based on literature that it is mainly conceptual and descriptive in nature. In addition, the parallel with linear growth stages is doubted, and an evolutional or a discontinuous perspective would appear more realistic [14]. Studies from the latter perspective are problem-oriented and define transitions between phases in terms of the dominant management problems to be addressed [15, 16]. To summarize, there is a consensus in the literature that organizations change over time in response to important problems related to survival. Despite criticism, a large number of authors describe multiple phases of organizational development, but the phase characteristics and transitions from phase to phase differ widely. The underlying empirical evidence for most models is limited and growth models can best be used in conceptual discussions about organizational development or as descriptive devices to represent patterns that have emerged [17].

Network organizations

A second related area is the development of networks. A network can be defined as more or less stable patterns of social relations among different actors (people, groups, organizations) who depend on each other to reach their goals without the existence of a dominant actor. Network relations imply that coordination among actors takes place on the basis of mutual benefit, reciprocity and trust [18]. There have been very few published reports evaluating ties among organizations in various types of network organizations in health care [5]. The limited evidence available on the effects on client outcomes are equivocal, with some finding no relationships and others finding support [19, 20, 21]. The logic underlying collaborative networks is however strong and compelling. Information-sharing within the network and organizational commitment to the network are of overriding importance. The complexity of this approach however, is that collaborating organizations often have different goals, funding streams and stakeholders, meaning that integration is not easily achieved in practice [5]. This implies that the process of building a collaborative interorganizational network can be difficult; as new relationships develop and the attitude towards the process remains positive, the level of trust may even decline [5, 22].

A study of various forms of network organizations in the business sector identified trust and equity as important issues in the development process of an interorganizational relationship [14]. The three stages of 'negotiations of joint expectations by formal bargaining and informal sense making', 'commitments for future actions' and 'execution of commitments' repeat and overlap one another and have a duration depending on the reliance on trust and role relationships. From a developmental perspective one conclusion is that network organizations will continually shape and restructure over time as a result of the actions and interpretations of the parties involved [14]. The limited studies and evidence available stress the need for more knowledge about these processes.

Quality improvement models

A range of quality management models is available for increasing the performance of health care organizations. Two models used in health care with assumptions concerning the process of development or levels of implementation are the Chronic Care Model (CCM) and the European Foundation Quality Management Excellence model (EFQM model) [23 - 26]. The CCM defines four levels, named 'A till D', in which level D describes components of the model in a limited implementation stage and level A describes the most developed stage. For example 'organizational goals of chronic care' do not exist or are limited to one condition at level D, but are measurable, reviewed routinely and incorporated at level A. The levels are described for providers to assess their situation and identify areas for improvement. The Dutch version of the EFQM model describes five phases of organizational growth, namely 'activity-oriented', 'process-oriented', 'system-oriented' 'chain-oriented' and 'transformation-oriented'. A complementary Dutch EFQM model for chain management uses the same phases for the development of interorganizational collaboration [27]. This expert-based model is of interest for integrated care for its dominant focus on interorganizational collaboration to optimize the total results of the care chain. However, the model's components in each phase are described at a generic level only and are not specified for health care. To summarize, both the CCM and EFQM model suggest phases or implementation stages. The description of phases is lacking (CCM) or is generic and not health-care specific (EFQM). The empirical evidence underlying the models is based on expert opinion.

From a review of the literature concerning organizational development, network organizations and quality improvement models, it appears that developmental processes are frequently described in the form of multiple stages or phases with different characteristics. How phases are defined and characterized differs and the evidence levels are merely based on expert opinion. It remains unclear if integrated care programmes develop similarly. We therefore conducted this two-step study to answer the following research questions: How can the development process of integrated care programmes be described and characterized? What essential elements of integrated care are important in each part of the development process?

Methods

A two-step study design was used, see figure one. To research what elements of integrated care are important in the developmental process, a consistent set of essential elements of integrated care is needed. The development of this set was the first step of our study. In the second step, which is the focus of this article, these elements are further researched in relation to the developmental process of integrated care. Because of the explorative nature of our research, we used multiple methods and qualitative and quantitative analyses to generate an empirical conceptual model of a complex process [28].

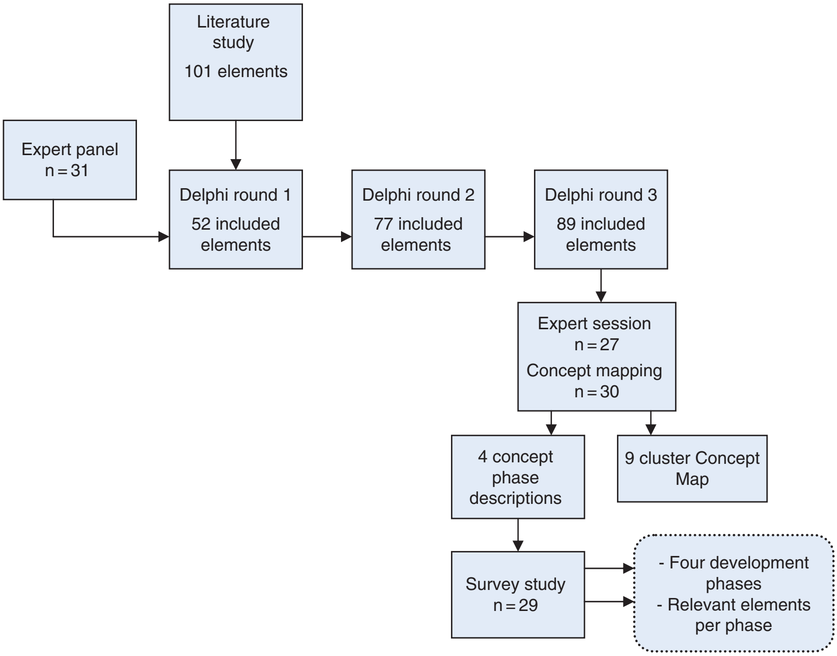

Figure 1. Study design

Elements of integrated care (part one)

To assess essential elements of integrated care, a pre-study involving a literature study, a Delphi study and Concept Mapping was conducted [29]. A structured multiple-source literature study (reviews, articles, theses, evaluation reports, quality management models) resulted in a list of 101 elements of integrated care. An element of integrated care is defined as an activity focusing on the development (realization, improvement, innovation or sustainability) of integrated care, based on the quality continuum of Feussner et al. [30]. In order to improve, complete and restrict the list of elements, a systematic Delphi study was carried out with a panel of 31 experts. Experts met the following criteria: multiple years of experience with integrated care, experience with multiple and different patient groups or integrated care settings, and expert knowledge based on research, implementation projects or practical experience.

All experts approved their participation by personal and e-mail confirmation for all parts of the study. No ethical approval was required because this research did not include patient but professional experts.

During three anonymous Delphi rounds each expert rated all elements on a four-category Likert scale with the following response categories: not important, moderately important, important or very important. Experts could make suggestions for reformulation of each element and could add new elements. After each round, elements were included (if > 80% scored the element as important or very important) or excluded (if >50% scored the element as not important or moderately important). These cut-off points were set in consultation with methodologists. New elements, reformulated elements and elements that were neither included nor excluded were presented in the next round. If suggestions for reformulation were made, they were analyzed individually by the researchers and reformulated on the basis of consensus. This systematic procedure resulted in a list of 89 elements of integrated care. All 31 experts completed all three Delphi rounds, which resulted in a 100% response score of this study.

To further analyze the list of elements, Concept Mapping was applied. During a session with the expert panel, 30 of the experts individually clustered the elements by means of a computerized groupware system. The data generated by the experts were stored in a database and used for the statistical procedure, which was carried out by the computer program ARIADNE version 2.0 [30]. Firstly, a point map was calculated by using multidimensional scaling [31]. The scaling procedure positioned each element on a two-dimensional map with four poles. Secondly, the coordinates of the point map were used in order to conduct hierarchical cluster analyses. After reviewing several cluster maps by following the advised procedure [32, 33], a nine-cluster solution best fitted the conceptual framework. In the next step nine subgroups of experts each analyzed one cluster with its elements and formulated a cluster label and a cluster description. The labels of the clusters were defined as: ‘Quality care’, ‘Performance management’, ‘Interprofessional teamwork’, ‘Delivery system’, ‘Roles and tasks’, ‘Patient-centeredness’, ‘Commitment’, ‘Transparent entrepreneurship’ and ‘Result-focused learning’ [29].

Development process of integrated care (part two)

Expert session

In the second part of this study we used the expert panel session and invited the same 31 Delphi panel experts to participate in a subsequent questionnaire study. A study protocol for the expert session was followed. All experts approved again their participation by e-mail confirmation for this second part of the study.

After the cluster exercise at the expert session, a three-step approach was used. Firstly, the facilitator introduced the question as to how the developmental process of integrated care could be characterized. After a plenary discussion, resulting in consensus that different developmental phases were recognized in practice, the experts were divided into nine groups. The groups were organized according to the panel characteristics of ‘background’ and ‘years of experience’ to balance the expert characteristics between the subgroups. Each group discussed whether, how many, and with what characterizing features developmental phases of integrated care are recognized in practice. Each group made notes on a prestructured sheet. The subgroup discussions were observed by the five members of the research team. In the third step, all subgroup notes were taken by the researchers and the results were presented in plenary and discussed. Both plenary discussions were taped and two researchers independently made notes of the discussion.

Questionnaire

The results of the expert panel session were analyzed by means of mutual comparisons of subgroup phase descriptions on the sheets. Apart from the subgroup analyses, the transcription and notes of the taped discussions were analyzed by two researchers. Based on these analyses, a concept description of a four-phase model was constructed.

To further develop and member-check the concept model with the panel, a two-part Excel based questionnaire was developed and e-mailed to the experts. In the first part, the phase descriptions were presented and the experts were asked whether phase descriptions were recognized in practice (yes, partly, or no). The experts could make comments or suggest reformulations. If suggestions for reformulation were made, these were analyzed individually by three researchers and reformulated on the basis of consensus. In the second part of the questionnaire, each expert individually reviewed the 89 elements of integrated care from the pre-study in relation to the four phases. Firstly, they were asked to mark in which of the four phases they felt the element was most relevant (scoring a double X, the total maximum score per phase is 2581). Secondly, for each element they marked whether they were also relevant in any of the other three phases (scoring a single X). For further analyses, a weight of three was assigned to each double X score and one to each single X score. The rationale for this non-linear scoring procedure is as follows. There was substantial consensus in the panel that the development phases are connected and that there are no (strict) boundaries between the phases. Elements can be relevant in multiple phases. Therefore, a forced choice scoring (only one score per element) was not useful. After consulting methodologists, assigning the weights of 3 and 1 seemed to be the most unambiguous scores. Other scoring methods have been explored and are reported in the result section. Descriptive statistics and frequency analyses were further used to analyze the results.

Results

Expert session

Of the 31 experts, 27 attended the expert-session and 29 responded to the questionnaire (response 94%). The characteristics of the experts are reported in table 1. In the plenary discussion, the experts reached consensus that the development process could be characterized by multiple distinguishable phases. The nine subgroups defined phases which ranged between three (four groups), four (three groups) and five (two groups) phases. The following plenary discussion resulted in a consensus that a four-phase description appeared to cover all the named aspects best. The phases were called 'initiative and design phase' (phase 1), 'experimental and execution phase' (phase 2), 'expansion and monitoring phase' (phase 3) and 'consolidation and transformation phase' (phase 4). Further analyses based on mutual comparisons of the subgroup sheets resulted in a compact description for each of the four phases including three key words. The results were used as input for the questionnaire research.

Table 1. Respondent characteristics

Characteristics	Category	Expert group N= 29
Gender	Male	41 %
	Female	59 %
Age (years)	Min – Max	27 – 63
	Average (sd)	44.69 (9.39)
	< 40	28 %
	40 – 50	48 %
	>50	24 %

Table 1. (Continued)

Years of experience	Min – Max	2 – 22
	Average (sd)	8.36 (4.80)
	< 5	21 %
	5 – 10	55 %
	> 10	24 %
Source of expertise	Research	14 %
	Research & practice	3 %
	Implementation programmes	28 %
	Research & impl. programmes	28 %
	Practice & impl. programmes	28 %
Dominant background	Professional	52 %
	Organizational/ health sciences	48 %

Questionnaire: Phase descriptions

Analyses of the questionnaire results showed a high percentage of confirmation of the phases described. The description of phase three was mostly fully recognized (86.2% n=25), followed by phase four (82.8% n=24), one (79.3% n=23) and two (69.0% n=20). The percentages of experts that partially recognized the description were 20.7 % (n=6) for phase one, 31.0 % for phase two (n=9), and 13.8 % for both phase three and four (n=4). Only one expert stated not to recognize one phase (phase four). The results did not show contradictory suggestions of the experts, so consensus on all remarks was achieved in the research team. Remarks concerning phase one (the initiative and design phase) were that not only a mutual problem but also a chance or already existing collaboration can lead to the start of an integrated care program. Next to defining the targeted patient population, the supply chain is defined and the collaboration could result in a signed-up agreement between parties in the care chain. Refinements of phase two, the experimental and execution phase, were the allotment of coordinating roles and the clarification of roles within the care chain. Another addition was mechanisms of knowledge transfer within the integrated care. The panel comments on phase three, the expansion and monitoring phase, were limited and led only to the inclusion of innovation among the key words. In the fourth phase, the consolidation and transformation phase, inclusion of information feedback loops and the continuous assessment of client and stakeholder needs were added. Further analyses of the experts' remarks resulted in the following phase descriptions and key words:

PHASE 1 Initiative and design phase:
The collaboration between health care providers has been intensified or started up. The starting point is a common problem or chance occurrence, or builds on current cooperation among care professionals. There is a sense of urgency and there are possibilities for working on these challenges in collaboration. The targeted patient group, the care chain and care process have been defined, as also the needs of patients and stakeholders. The level of ambitions, motivation and leadership determine the progress achieved. A multidisciplinary team designs an experiment or project to execute the present ideas. The collaboration can be signed up in an agreement among care partners.

Key words: Exploring possibilities/impossibilities, ambitions and chances, (project) design and collaboration agreements.

PHASE 2 Experimental and execution phase:
New initiatives or projects are being executed in the care chain. The aims, content, roles, and tasks in the care chain have been clarified and written down in care pathways and protocols. There is coordination on the level of the care chain by for instance installing coordinators or setting up meetings. Information about patient groups, working procedures or professional knowledge is exchanged. There are experiments within the collaboration, results are evaluated to learn from and reflect on. Preconditions for projects have been considered and boundary conditions have been solved by collaborative means or agreements among care providers.

Key words: Writing down aims and content of the collaboration, coordination at care chain level, experimenting and reflecting.

PHASE 3 Expansion and monitoring phase:
Projects have been expanded or integrated in integrated care programmes. Agreements on the content, tasks and roles within the care chain are clear and signed up. Collaboration is no longer on an informal basis. Results are systematically monitored and improvement areas identified. The targeted population has been surveyed. More collaborative initiatives emerge such as mutual education programmes. There is a continuous commitment to the ambition of the integrated care program. Interorganizational barriers and fragmented financial structures are on the agenda of care partners.

Key words: Further development and maturity, monitoring and improving results, new questions and innovation.

PHASE 4 Consolidation and transformation phase:
The integrated care program is the regular way of working and providing care. Coordination at care chain level is operational; information is being shared, transferred and fed back. A monitoring system periodically shows if results are sustained, what specific improvement possibilities have been identified and to what extent patient needs have been met. The program builds further on successful results. Organizational structures transform or are newly designed around the integrated care program. Financial agreements are arranged with financers by means of integral contracts covering the care chain as a whole. Partners in the care chain explore new options for collaboration in the external environment with other partners.

Key words: Continuous improvement, new ambitions, structures fitting the integrated care program (organizational structures, integral financing).

Questionnaire: Elements of integrated care

Twenty-nine experts each rated the 89 elements (response 94%). In total 77 out of the 89 elements were rated by at least one expert as mostly relevant in all four phases, 11 elements were rated in three phases as mostly relevant and one element was rated in two phases. All of the 89 elements were scored as relevant in the four phases by at least one expert. Only two elements were not scored as relevant in one phase by the experts. The total results are presented in table 3.

Of the total numbers of 'most relevant' scores, 812 were scored in phase two, 781 in phase three, 675 in phase one and 313 in phase four. The most scores of 'also relevant' were scored in phase four (1072), the least in phase one (428), and 783 and 945 scores in phases two and three. By assigning the weights as described in the methods section, the top 10 elements of every phase have been calculated (see table 2). Other scoring methods have been explored (e.g. assigning weights of 1 and 5 or 0 and 1), but gave no significant differences in the top ten elements of all four phases.

The questionnaire results show that the description of phase four is highly confirmed (82.8%, n=24), but the least numbers of elements are assigned to this phase as 'most relevant' whereas the most 'also relevant' scores are given in this phase. Experts remarked in the discussion that the fourth phase is recognized, but sometimes also partially a desired phase for the near future.

Table 2. Top ten elements per phase

PHASE 1. Initiative and design phase		
Rank	**Weight***	**Element description**
1	65.83 %	Defining the ambitions and aims of the collaboration in the care chain
2	65.49 %	Defining the targeted client group
3	52.46 %	Defining and assessing the characteristics of the collaboratively delivered care
4	46.15 %	Assuring the leadership commitment of the partners involved in the care chain
5	45.08 %	Committing to a joint responsibility for the final goals and results to be achieved
6	42.37 %	Establishing dependencies among care partners
7	41.13 %	Describing the tasks and authorities of leaders, coordinators and advisory boards in the care chain
8	40.87 %	Reaching agreements on referrals and transfer of clients through the care chain
9	40.83 %	Signing collaboration agreements among care partners
10	40.34 %	Reaching agreements on procedures for the exchange of client information
PHASE 2. Experimental and execution phase		
Rank	**Weight***	**Element description**
1	52.76 %	Realizing direct contact among professionals in the care chain
2	48.36 %	Using shared client treatment and care plans
3	47.90 %	Bringing specialized nurses into action through the care chain
4	46.92 %	Achieving adjustments among care partners by means of direct contact
5	45.11 %	Using evidence-based guidelines and standards

Table 2. (Continued)

6	44.80 %	Monitoring successes and results during the development of the integrated care chain
7	44.35 %	Reaching agreements among care partners on discharge planning
8	43.85 %	Working in multidisciplinary teams
9	42.86 %	Ensuring that professionals in the care chain are informed of each other's expertise and tasks
10	42.52 %	Gathering data on client logistics (e.g. volumes, waiting periods and throughput times) in the care chain
PHASE 3. Expansion and monitoring phase		
Rank	**Weight***	**Element description**
1	50.41 %	Using a systematic procedure for the evaluation of agreements, approaches and results
2	49.14 %	Flexible adjustment of integrated care corresponding to individual clients' needs
3	47.20 %	Monitoring and analyzing mistakes/near mistakes in the care chain
4	46.67 %	Reaching agreements on introducing and integrating new partners in the care chain
5	46.40 %	Using collaborative education programmes and learning environments for the professionals of care partners
6	45.38 %	Involving client representatives in improvement projects in the care chain
7	45.30 %	Designing care for clients with multi- or co-morbidities
8	44.35 %	Collaborative learning in the care chain in order to innovate integrated care
9	43.97 %	Developing connections between databases of partners in the care chain
10	43.90 %	Making transparent the effects of the collaboration on the production of the care partners
PHASE 4. Consolidation and transformation phase		
Rank	**Weight***	**Element description**
1	40.18 %	Offering a single collaborative financial contract to financing parties by the collective of care partners

Table 2. (Continued)

2	39.17 %	Linking consequences to the achievement of agreed goals
3	39.02 %	Integrating incentives for rewarding the achievement of quality targets
4	29.77 %	Structural meetings with external parties such as insurers, local governments and inspectorates
5	29.69 %	Sharing knowledge among care partners about effectively organizing sustainable integrated care
6	28.80 %	Using collaborative education programmes and learning environments for the professionals of care partners
7	28.00 %	Monitoring and analyzing mistakes/near mistakes in the care chain
8	27.27 %	Developing care programmes for relevant client subgroups
9	27.27 %	Reaching agreements about letting go care partner domains
10	27.20 %	Reaching agreements on the financial budget for integrated care

Legend: Percentage of the total element score appointed in this phase (most important weight 3, also important weight 1)*

Table 3. Relevance of elements of integrated care per development phase

Description: The data provided represent the percentages of experts that indicate each element as 'most relevant' or also relevant (in brackets) for every development phase. The elements are presented per cluster for each of the nine clusters of the model.

Cluster 1. Patient-centeredness This cluster is about developing integrated care and information flows tailored to specific patient groups/subgroups. Elements focus on integrated patient and care-process support information such as front offices, self-management support or information systems, and delivering care tailored to individual needs (e.g. multi-morbidity).				
% most relevant (also relevant). N=29				
Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Element description**
20.7 (13.8)	41.4 (34.5)	20.7 (55.2)	17.2 (48.3)	Providing understandable and client-centred information
6.9 (17.2)	51.7 (27.6)	24.1 (51.7)	17.2 (37.9)	Collaboratively offering client information from the care partners
13.8 (10.3)	17.2 (37.9)	55.2 (17.2)	13.8 (37.9)	Designing care for clients with multi- or co-morbidities
3.4 (13.8)	51.7 (20.7)	24.1 (51.7)	20.7 (44.8)	Using self-management support methods as a part of integrated care
20.7 (13.8)	24.1 (44.8)	41.4 (31.0)	13.8 (48.3)	Implementing care process-supporting clinical information systems
0 (17.2)	20.7 (27.6)	58.6 (20.7)	20.7 (34.5)	Flexible adjustment of integrated care corresponding to individual clients' needs
20.7 (13.8)	31.0 (27.6)	37.9 (31.0)	10.3 (27.6)	Developing a front office: single entry point for client information
17.2 (6.9)	31.0 (27.6)	34.5 (41.4)	17.2 (41.4)	Using a protocol for the systematic follow-up of clients
27.6 (6.9)	6.9 (41.4)	37.9 (37.9)	27.6 (31.0)	Developing care programmes for relevant client subgroups

Table 3. (Continued)

Cluster 2. Delivery system

Chain and client logistics, coordination mechanisms and procedures for streamlining the care process for the whole care chain is the main focus of this cluster. The reaching of agreements (e.g. logistics, sharing expertise), procedures (e.g. information exchange) or tools (e.g. care plans) in the care chain that are necessary from the client's initial entry into the care chain until the final contact are reflected in this cluster.

Phase 1	Phase 2	Phase 3	Phase 4	Element description
51.7 (6.9)	34.5 (34.5)	10.3 (31.0)	3.4 (24.1)	Reaching agreements on referrals and transfer of clients through the care chain
41.4 (13.8)	37.9 (20.7)	13.8 (34.5)	6.9 (31.0)	Reaching agreements on procedures for information exchange (content, method, responsibilities)
13.8 (17.2)	27.6 (31.0)	34.5 (34.5)	24.1 (41.4)	Using a single client-monitoring record accessible for all care partners
51.7 (10.3)	34.5 (27.6)	10.3 (34.5)	3.4 (37.9)	Reaching agreements on procedures for the exchange of client information
13.8 (6.9)	13.8 (27.6)	51.7 (20.7)	20.7 (44.8)	Developing connections between databases of partners in the care chain
10.3 (10.3)	31.0 (24.1)	37.9 (41.4)	20.7 (37.9)	Offering case management for clients with complex needs
37.9 (3.4)	27.6 (37.9)	27.6 (34.5)	6.9 (31.0)	Reaching agreements on chain logistics (e.g. waiting periods and throughput times)
10.3 (17.2)	62.1 (17.2)	13.8 (48.3)	13.8 (37.9)	Using shared client treatment and care plans
24.1 (10.3)	41.4 (17.2)	20.7 (44.8)	13.8 (34.5)	Using uniform client-identification numbers within the care chain
27.6 (13.8)	37.9 (34.5)	27.6 (34.5)	6.9 (34.5)	Reaching agreements among care partners on the consultation of experts and professionals
27.6 (13.8)	41.4 (31.0)	20.7 (31.0)	10.3 (27.6)	Reaching agreements among care partners on managing client preferences
31.0 (20.7)	44.8 (20.7)	20.7 (31.0)	3.4 (24.1)	Reaching agreements among care partners on scheduling client examinations and treatment
27.6 (13.8)	51.7 (20.7)	17.2 (37.9)	3.4 (24.1)	Reaching agreements among care partners on discharge planning
34.5 (13.8)	41.4 (20.7)	13.8 (27.6)	10.3 (17.2)	Developing criteria for the inclusion and throughput of clients in the care chain
20.7 (13.8)	31.0 (31.0)	41.4 (20.7)	6.9 (24.1)	Reaching agreements among care partners on providing care to waiting-list clients
17.2 (17.2)	62.1 (10.3)	13.8 (44.8)	6.9 (37.9)	Bringing specialized nurses into action through the care chain

Table 3. (Continued)

24.1 (24.1)	37.9 (17.2)	20.7 (20.7)	17.2 (27.6)	Reaching agreements on linking clients to outside resources or community care partners
34.5 (3.4)	44.8 (24.1)	20.7 (27.6)	0.0 (27.6)	Developing criteria for assessing clients' urgency

Cluster 3. Performance management

Measurement and analyses of the results of the care delivered in the care chain is the central theme of this cluster. Elements address performance targets at all levels, monitored by the standardized use of indicators. Indicators address client outcomes, client judgments, organizational outcomes and financial performance data. Mistake/near-mistake analysis, feedback mechanisms and improvement teams are also used to improve and manage the level of performance.

Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Element description**
27.6 (20.7)	17.2(34.5)	41.4 (27.6)	13.8 (34.5)	Defining performance indicators to evaluate the results of the integrated care delivered
6.9 (13.8)	41.4 (27.6)	41.4 (34.5)	10.3 (58.6)	Providing feedback to care partners on transfers
10.3 (10.3)	44.8 (34.5)	41.4 (41.4)	3.4 (44.8)	Gathering client-related performance data (health status, quality of life)
17.2 (10.3)	51.7 (31.0)	27.6 (44.8)	3.4 (51.7)	Gathering data on client logistics (e.g. volumes, waiting periods and throughput times) in the care chain
6.9 (13.8)	41.4 (27.6)	41.4 (34.5)	10.3 (58.6)	Using feedback and reminders by professionals for improving care
34.5 (17.2)	20.7 (27.6)	37.9 (34.5)	6.9 (41.4)	Reaching agreements about the uniform use of performance indicators in the care chain
3.4 (13.8)	55.2 (27.6)	37.9 (37.9)	3.4 (51.7)	Monitoring successes and results during the development of the integrated care chain
27.6 (17.2)	24.1 (34.5)	31.0 (27.6)	17.2 (37.9)	Establishing quality targets for the performance of the whole care chain
0 (6.9)	24.1 (27.6)	55.2 (37.9)	20.7 (58.6)	Monitoring and analyzing mistakes/near mistakes in the care chain
6.9 (13.8)	6.9 (41.4)	62.1 (27.6)	24.1 (41.4)	Using a systematic procedure for the evaluation of agreements, approaches and results
3.4 (6.9)	37.9 (20.7)	37.9 (48.3)	20.7 (51.7)	Monitoring client judgments and satisfaction for the whole care chain
6.9 (10.3)	37.9 (27.6)	41.4 (44.8)	13.8 (51.7)	Gathering financial performance data for the care chain
3.4 (10.3)	31.0 (27.6)	51.7 (31.0)	13.8 (55.2)	Making transparent the effects of the collaboration on the output of the care partners
6.9 (10.3)	31.0 (37.9)	44.8 (37.9)	17.2 (48.3)	Monitoring whether the care delivered corresponds with evidence-based guidelines

Table 3. *(Continued)*

27.6 (13.8)	13.8 (48.3)	41.4 (17.2)	17.2 (34.5)	Establishing quality targets for the performance of care partners
13.8 (24.1)	27.6 (27.6)	48.3 (41.4)	10.3 (48.3)	Installing improvement teams at care-chain level
Cluster 4. Quality care This cluster contains elements that focus on the design of a multidisciplinary care pathway throughout the care chain, based on evidence-based guidelines and standards and clients' needs and preferences. A needs assessment of the specific client group is required for this purpose, combined with the involvement of client representatives in designing, improving, and monitoring the integrated care.				
Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Element description**
31.0 (20.7)	37.9 (44.8)	31.0 (37.9)	0 (51.7)	Systematically assessing the needs of the clients in the care chain
48.3 (20.7)	37.9 (34.5)	13.8 (31.0)	0 (37.9)	Developing a multidisciplinary care pathway
6.9 (24.1)	24.1 (31.0)	55.2 (37.9)	13.8 (55.2)	Involving client representatives in improvement projects in the care chain
24.1 (24.1)	58.6 (31.0)	13.8 (51.7)	3.4 (51.7)	Using evidence-based guidelines and standards
20.7 (17.2)	24.1 (37.9)	37.9 (48.3)	17.2 (44.8)	Involving client representatives by monitoring the performance of the care chain
Cluster 5. Result-focused learning A learning climate of striving towards continuously improved results in the care chain is this cluster's central theme. The elements address essential ingredients for improvement: defining goals for collaboration, identifying bottlenecks and gaps in care, and ways of learning and exchanging knowledge in an open atmosphere. Incentives are used to reward improved performance.				
Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Element description**
24.1 (24.1)	24.1 (44.8)	27.6 (48.3)	24.1 (44.8)	Stimulating a learning culture and continuous improvement in the care chain
69.0 (13.8)	13.8 (37.9)	13.8 (31.0)	3.4 (37.9)	Defining and assessing the characteristics of the collaboratively delivered care
10.3 (20.7)	34.5 (37.9)	51.7 (27.6)	3.4 (37.9)	Making transparent the benefits of the collaboration for each care-chain partner

Table 3. (Continued)

31.0 (17.2)	27.6 (37.9)	37.9 (41.4)	3.4 (48.3)	Collaboratively assessing bottlenecks and gaps in care
13.8 (34.5)	24.1 (34.5)	31.0 (34.5	31.0 (37.9)	Sharing knowledge among care partners about effectively organizing sustainable integrated care
27.6 (34.5)	41.4 (31.0)	24.1 (44.8)	6.9 (62.1)	Striving towards an open culture for discussing possible improvements for care partners
24.1 (24.1)	34.5 (31.0)	31.0 (41.4)	10.3 (58.6)	Learning by the exchange of information among professionals about the care process
10.3 (20.7)	13.8 (27.6)	31.0 (44.8)	44.8 (31.0)	Integrating incentives for rewarding the achievement of quality targets
10.3 (13.8)	20.7 (37.9)	51.7 (34.5)	17.2 (62.1)	Using knowledge and information for directing and coordinating the care chain
10.3 (6.9)	10.3 (37.9)	55.2 (34.5)	24.1 (51.7)	Using collaborative education programmes and learning environments for the professionals of care partners
3.4 (13.8)	6.9 (31.0)	48.3 (31.0)	41.4 (37.9)	Linking consequences to the achievement of agreed goals
6.9 (17.2)	20.7 (31.0)	51.7 (34.5)	20.7 (44.8)	Collaborative learning in the care chain in order to innovate integrated care
Cluster 6. Interprofessional teamwork This cluster represents interprofessional teamwork for a well-defined client group. The defined client group is the target to be reached by collaborating professionals, working in well-organized multidisciplinary teams in the care chain.				
Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	**Element description**
79.3 (17.2)	17.2 (27.6)	3.4 (24.1)	0 (20.7)	Defining the targeted client group
27.6 (13.8)	58.6 (20.7)	13.8 (62.1)	0 (51.7)	Working in multidisciplinary teams
51.7 (13.8)	31.0 (41.4)	17.2 (48.3)	0 (51.7)	Reaching agreements on the availability and accessibility of professionals
Cluster 7. Roles and tasks The need for clarity about each other's expertise, roles and tasks in the care chain is reflected in this cluster. Effective collaboration at all levels, with new partners and by allocating coordinating roles are the main components.				

Table 3. (Continued)

Phase 1	Phase 2	Phase 3	Phase 4	Element description
48.3 (20.7)	34.5 (20.7)	13.8 (34.5)	3.4 (34.5)	Reaching agreements among care partners on tasks, responsibilities and authorizations
20.7 (17.2)	62.1 (24.1)	17.2 (55.2)	0 (51.7)	Achieving adjustments among care partners by means of direct contact
27.6 (17.2)	51.7 (20.7)	20.7 (41.4)	0 (31.0)	Ensuring that professionals in the care chain are informed of each other's expertise and tasks
41.4 (17.2)	37.9 (6.9)	13.8 (20.7)	6.9 (24.1)	Installing a coordinator working at chain-care level
48.3 (13.8)	31.0 (34.5)	17.2 (27.6)	3.4 (31.0)	Establishing the roles and tasks of multidisciplinary team members
10.3 (20.7)	72.4 (13.8)	17.2 (51.7)	0 (51.7)	Realizing direct contact among professionals in the care chain
10.3 (27.6)	6.9 (31.0)	58.6 (17.2)	24.1 (37.9)	Reaching agreements on introducing and integrating new partners in the care chain
31.0 (20.7)	34.5 (34.5)	27.6 (24.1)	6.9 (34.5)	Directing the care chain by appointing a limited number of persons with coordinating tasks

Cluster 8. Commitment

This cluster's focus is on collaborative commitment and ambition in the care chain. Commitment towards clearly defined goals and a collaborative ambition, apart from awareness of dependencies and domains. The commitment of leaders to the care chain and the awareness of working in a care chain are also components.

Phase 1	Phase 2	Phase 3	Phase 4	Element description
89.7 (3.4)	0 (41.4)	10.3 (24.1)	0 (44.8)	Defining the ambitions and aims of the collaboration in the care chain
48.3 (24.1)	24.1 (20.7)	17.2 (34.5)	10.3 (34.5)	Signing collaboration agreements among care partners
62.1 (20.7)	20.7 (37.9)	17.2 (44.8)	6.9 (44.8)	Assuring the leadership commitment of the partners involved in the care chain
51.7 (20.7)	24.1 (31.0)	17.2 (37.9)	6.9 (37.9)	Describing the tasks and authorities of leaders, coordinators and advisory boards in the care chain

Table 3. (Continued)

48.3 (27.6)	31.0 (17.2)	17.2 (27.6)	3.4 (34.5)	Establishing dependencies among care partners
34.5 (24.1)	34.5 (27.6)	24.1 (44.8)	6.9 (48.3)	Guiding the care chain by emphasizing a collaborative commitment
41.4 (27.6)	27.6 (37.9)	20.7 (37.9)	10.3 (51.7)	Structural meetings of leaders of care-chain organizations
27.6 (37.9)	10.3 (44.8)	34.5 (31.0)	27.6 (41.4)	Reaching agreements about letting go care partner domains
51.7 (13.8)	34.5 (41.4)	10.3 (65.5)	3.4 (58.6)	Stimulating trust among care partners
31.0 (20.7)	44.8 (37.9)	20.7 (48.3)	3.4 (55.2)	Stimulating the awareness of working in a care chain
13.8 (20.7)	24.1 (31.0)	34.5 (48.3)	27.6 (51.7)	Structural meetings with external parties such as insurers, local governments and inspectorates

Cluster 9. Transparent entrepreneurship

This cluster concentrates on space for innovation (experiments), leadership responsibilities for performance achievement and joint financial agreements covering the integrated care. Preconditions for entrepreneurship, including financial preconditions, are represented in the collection of elements.

Phase 1	Phase 2	Phase 3	Phase 4	Element description
58.6 (13.8)	6.9 (34.5)	24.1 (27.6)	10.3 (44.8)	Making commitment to a joint responsibility for the final goals and results to be achieved
34.5 (24.1)	31.0 (37.9)	24.1 (44.8)	10.3 (51.7)	Using a uniform language in the care chain
31.0 (27.6)	13.8 (31.0)	31.0 (27.6)	24.1 (44.8)	Reaching agreements on the financial budget for integrated care
34.5 (20.7)	24.1 (31.0)	31.0 (37.9)	10.3 (62.1)	Allocating financial budgets for the implementation and maintenance of integrated care
13.8 (27.6)	37.9 (27.6)	37.9 (37.9)	10.3 (48.3)	Involving leaders in improvement efforts in the care chain
37.9 (10.3)	27.6 (24.1)	24.1 (34.5)	10.3 (24.1)	Creating an open environment that encourages experiments and pilot projects
13.8 (10.3)	10.3 (24.1)	31.0 (31.0)	44.8 (20.7)	Offering a single collaborative financial contract to financing parties by the collective of care partners

Discussion

Study reflections

Our explorative study resulted in a four-phase model that describes developmental phases of integrated care programmes in the Netherlands. The phase descriptions were individually member-checked and confirmed by an expert panel. The dedication of the experts during the total study was remarkable and resulted in nearly perfect response rates, which indicates the study relevance. Our findings regarding the number of phases corresponds with the review of Phelps et al. [13]. In their review of 33 life-cycle models for organizations, about 70% of the models describe three to five phases, with the most (nine models) describing four phases. Quinn and Cameron [10] also composed a four-phase model based on their analyses of nine life-cycle models and concluded that common stages of development can be identified. As expressed in the plenary and subgroup discussions, the phases are meant to describe and characterize, not to prescribe or predict. The phases give an overview of commonly acknowledged processes or activities without any judgement about what phase is best when. This is a difference from some of the life-cycle models in the international literature, as these models sometimes assume 'predictable patterns' that organizations will or should follow. Interestingly, the experts do not define a phase of decline or termination of the development process, whereas in practice programmes also sometimes end.

The similarities between the qualitative descriptions of the phases and the top ten elements in each phase (table 2) are evident. Like in the description of the first phase, elements that focus on defining the domain of integrated care, operational interorganizational processes (such as arranging patient transfers) and commitment are stressed as being the most important to realize. In the second phase too, elements that arrange coordination and streamline care processes are to be found in both study results. However, direct contact (as the most important element in phase two) appears more implicit in the description, but is necessary for the exchange of working procedures or professional knowledge. For the third and fourth phases the overlap is also clear, whereas the elements sometimes point out more specific examples (like 'analyzing near mistakes') of more generic formulations in the phase descriptions (like 'systematically monitored results').

Study findings related to the main literature

Regarding the related literature, there is some overlap with organizational life-cycle models such as Quinn and Cameron's [10] four-phase model. As in our model, their first phase is the entrepreneurial stage in which lots of ideas, entrepreneurial activities and little planning and control are present. Their fourth 'elaboration of structure' stage contains domain expansion, renewal and changing structures which are comparable with activities within our consolidation and transformation phase. However, their second phase focusses on collectivity and their third phase on formalization and control. Whereas in our model the intensity of control and coordination also increases in each phase, the structures are not stable or focused on conservation. Like in the literature on networks, the parties in the collaboration cause the integrated care program to shape and restructure over time, and to expand, innovate and transform [14].

When looking at the characteristics of the phases, the intensity of collaboration and the nature of the activities show different emphases in each phase. The levels of integration as defined by Leutz [34] – linking, coordinating and full integration – are mirrored in the descriptions. In the 'initiative and design' phase, the linking of providers, through cooperation, the sharing of information and definition of responsibilities for each service without shifting costs and responsibilities is present. In the second and third phases, coordination is the dominant level and explicit structures and managers are installed in order to coordinate benefits and care across the care program. As in the case of Leutz, in our second and third phases the integrated care operates largely through the separate structures of the current systems. Leutz's third level of 'full integration' is mirrored in our fourth phase description where new programmes or resources from multiple systems are pooled and structures transform.

In relation to the frequently used CCM and EFQM, there are some parallels with (in particular) the EFQM model. The EFQM defines five phases and appears to point out a more stepwise and rational model, where this study's model also emphasizes aspects such as commitment, contact, opportunities, and experiments. The importance of trust, commitment, and equity as mentioned in the literature on networks appears to contribute to the interorganizational collaboration in integrated care.

The Chronic Care Model defines four stages of development, but the stages themselves are not described. A difference is that the elements within the CCM differ in intensity or presentation per phase, but show an increased level from phase D to phase A. In our model, a number of elements are merely phase-specific and are not all that relevant in others. Each upcoming phase is not (only) a step further in development, but can also have new and phase-specific characteristics.

Research limitations and implications

The systematic Delphi approach, which had as its starting point a systematic literature study combined with the strictly followed procedures of Concept Mapping and standardized computer-supported statistical analyses, contributes to the internal validity of this study. Using a protocol for the expert session and executing analyses of the results by multiple researchers also contribute to this. Although a committed expert panel with extensive experience in integrated care was involved in this study, our explorative study has the limitation that it uses the expert opinion of a panel of Dutch experts. Contextual factors such as the type of health care system, social values, health reform, the history of quality and the language and politics of quality will have influenced the results [35]. However, we think that for multiple reasons the study is of value for many readers in other countries. Firstly, in our literature study we included international literature which was the input for the Delphi study and the elements of the model. Secondly, the focus of the model is on integration processes. As described by Nies and Bergman [2] and Van Raak et al. [3], in a lot of countries there are separate sectors for acute care, long term care and social care. A mutual problem in these countries is how to integrate care processes. The Dutch health care system is a complex social insurance-based one with multiple components and a clear split between acute health care and long-term and social care [3]. For a large number of patients, health care professionals from all three sectors are involved. Within this complex system, contradictory impulses are send out by the Dutch health care policy makers. On the one hand integrated care is stimulated, but at the same time competition is stimulated and new financial structures do not facilitate integrated care. This complex and fragmented situation assumes that the study results will be of value for other systems that also experience a lot of fragmentation. Lastly, our expert panel consisted partly of experienced researchers in integrated care, who also have participated in international studies before. However, Dutch contextual factors may have played a role in our study. Therefore a suggestion for further research is to expand this study to other countries.

Practical implications and further research

The development model can be used as an assessment and discussion tool in integrated care practice. Managers and professionals can use the model to reflect on the development of their practice, to discuss which elements are or are not present and to identify improvement suggestions. Together with the nine clusters of integrated care and the concept map developed in the pre-study [29], a rich model for assessing and improving integrated care practices has been developed. A suggestion for further research is to improve the external validity by replication of the study in other countries and healthcare systems. Another suggestion for further research is to use the model as a framework for evaluation designs to assess the development of integrated care programmes. The relationship between the developmental process and outcomes of care is another suggestion for further study. Interesting questions are whether different developmental phases relate to different outcomes, or what characterizes integrated care programmes with the best performance. Lastly, it may be assumed that managers and professionals will need different competences in the different phases. Research providing a further insight into each developmental phase is therefore recommended.

Conclusions

This study provides a descriptive model of the development process that integrated care services can undergo in the Netherlands. Integrated care development can be characterized by four developmental phases: the initiative and design phase; the experimental and execution phase; the expansion and monitoring phase; and the consolidation and transformation phase. Different elements of integrated care have been identified in the various developmental phases. The findings have important implications for integrated care services, which can use the model as an instrument to reflect on their current practices and help to identify improvement areas. The model provides a framework for developing evaluation designs for integrated care arrangements. To conclude, the limited literature and evidence about the developmental process of integrated care programmes emphasize the relevance of this explorative study. The wide-ranging attention towards integrating care and developing integrated care arrangements in developed countries underlines the need for further research on this topic by means of replicating or expanding this study.

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Chapter 7

The implementation of integrated care: the empirical validation of the Development Model for Integrated Care

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The implementation of integrated care: the empirical validation of the Development Model for Integrated Care

Abstract

Background

Integrated care is considered as a strategy to improve the delivery, efficiency, client outcomes and satisfaction rates of health care. To integrate the care from multiple providers into a coherent client-focused service, a large number of activities and agreements have to be implemented like streamlining information flows and patient transfers. The Development Model for Integrated care (DMIC) describes nine clusters containing in total 89 elements that contribute to the integration of care. We have empirically validated this model in practice by assessing the relevance, implementation and plans of the elements in three integrated care service settings in The Netherlands: stroke, acute myocardial infarct (AMI), and dementia.

Methods

Based on the DMIC, a survey was developed for integrated care coordinators. We invited all Dutch stroke and AMI-services, as well as the dementia care networks to participate, of which 84 did (response rate 83 %). Data were collected on relevance, presence, and year of implementation of the 89 elements. The data analysis was done by means of descriptive statistics, Chi Square, ANOVA and Kruskal-Wallis H tests.

Results

The results indicate that the integrated care practice organizations in all three care settings rated the nine clusters and 89 elements of the DMIC as highly relevant. The average number of elements implemented was 50 ± 18, 42 ± 13, and 45 ± 22 for stroke, acute myocardial infarction, and dementia care services, respectively. Although the dementia networks were significantly younger, their numbers of implemented elements were comparable to those of the other services. The analyses of the implementation timelines showed that the older integrated care services

had fewer plans for further implementation than the younger ones. Integrated care coordinators stated that the DMIC helped them to assess their integrated care development in practice and supported them in obtaining ideas for expanding their integrated care activities.

Conclusions

Although the patient composites and the characteristics of the 84 participating integrated care services differed considerably, the results confirm that the clusters and the vast majority of DMIC elements are relevant to all three groups. Therefore, the DMIC can serve as a general quality management tool for integrated care. Applying the model in practice can help in steering further implementations as well as the development of new integrated care practices.

Background

When a patient's needs cannot be covered by one professional or health care provider alone, collaboration between different providers is required. The collaborative efforts and commitment to organize care for a specific patient group in a streamlined way are generally referred to as 'integrated care,' 'coordinated care', 'collaborative care' or 'chronic disease management' programmes. An integrated care service is defined as a coherent and coordinated set of services which are planned, managed and delivered to individual service users across a range of organizations and by a range of co-operating professionals and informal carers [1]. The available range of terminologies for integrated care and for the underlying concept of integration, illustrates the complexity of this topic. Many researchers and policy makers have distinguished many different dimensions of integration, with the most common taxonomies differentiating the type, breadth and degree of integration [2]. For types of integration, the literature differentiates functional integration, organizational integration, professional integration and clinical integration [3-5]. The breath of integration, often defined as 'horizontal, vertical or virtual', refers to the range and type of healthcare services that collaborate to provide the integrated care. For the degree of integration, Leutz [6, 7] is the most frequently cited expert and defines the three levels; 'linkage', 'coordination' and 'integration'. The choice of the level of integration depends on the needs and complexity of the client groups, ranging from intense full integration for complex, multi-morbid clients till only linkage of different systems for less complex situations.

The need for integrated care has grown in the past decade. There is an increasing interest in how health care workers, managers and policy makers could implement effective integrated care services. This situation can be explained by multiple developments. Firstly, the increasing numbers of elderly people and those with chronic illnesses require a shift in focus from acute to chronic care. Further, for many diseases the amount of hospital time has declined which raises the need for close and early connections with long term and social care [8, 9]. In addition, in multiple countries the majority of the elderly people prefer to live at home as long as possible, which has made well-organized home care, social care, and palliative care more important [10]. Lastly, in a large number of countries the acute, long-term, and social care areas have separate legal and financial systems. This situation often causes fragmentation and an increase in the complexity of the collaboration [10-12]. To summarize, the shifting needs of patients and the way care is organized in a number of countries on both the micro- (patient), meso- (organizational) as macro- (system) level, results in all kinds of fragmentation. The aim of integrated care is therefore to reduce this fragmentation and deliver better results and outcomes of care on multiple dimensions.

Implementing integrated care

Whereas the rationale for integrated care has been recognized, the implementation of this type of care is often complex. Although much research has been conducted on integrated care, the studies available only address specific settings and patient groups, while their conclusions regarding which elements should be implemented are partially incompatible [13-16]. Systematic reviews and studies of organizational interventions aimed at improving patient care have established that integrated care could improve care processes, patient outcomes and, although more inconclusive, reduce costs [3, 17-20]. Glasby [21] describes the importance of implementing integrated care activities on multiple levels. Activities on the operational or individual level are, for example, streamlining information flows and an accurate transfer of patients, while implementation challenges on a tactical or level refer to for instance measuring performance indicators on a care chain level. Further, the commitment of representatives on a strategic level is required for realizing sustainability and (financial) agreements among professionals or organizations. In practice, the project leaders and coordinators of integrated care daily struggle with the question which care elements to implement and in what order.

In the past decade a number of quality management models or frameworks like the Chronic Care Model and it's later versions like the Innovative Care for Chronic Conditions Framework and the Expanded Care Model; the Public Health Model, the Continuity of Care model, the Guided Care model, the Kaiser model, the Evercare model, Pfizer approaches, the PACE model, the PRISM model, the Strengths model, the Evaluation Framework for disease management and the European Foundation for Quality Management Model (EFQM) have been developed which could be used by these professionals [2, 22-29]. When we select those models that have healthcare specific versions, that are internationally and frequently used and have assumed or proven relations between the models components and better results in health care, only the EFQM quality management model and the Chronic Care Model (CCM) remain.

However, these models do not have integrated care as a dominant and generic perspective. The EFQM quality management model primarily concentrates on the dynamics within organizations and not on interorganizational care pathways [29]. And although the CCM may be more helpful, it is aimed at chronic patient groups, leaving integrated care with also acute aspects (such as trauma care) out of scope [14, 15]. In a previous study we therefore developed a quality management model for integrated care, called the Development Model for Integrated Care (DMIC) [30, 31].

The Development Model for Integrated Care

The evidence- and expert-based Development Model for Integrated Care consists of 89 elements grouped in nine clusters. The elements represent a wide range of activities considered as relevant to the realization of integrated care. The clusters are named as follows: 'patient-centeredness', 'delivery system', 'performance management', 'quality of care', 'result-focused learning', 'interprofessional teamwork', 'roles and tasks', 'commitment', and 'transparant entrepreneurship' (see additional file 1). Implementing the elements of all nine clusters contributes to the further development of integrated care. The model intends to be generic and suitable for diverse patient groups that make use of both chronic and acute care services. The model has the potential to serve as an assessment tool for health care professionals, managers and integrated care coordinators to support the implementation of improvement activities. In this study we have empirically tested our theoretical expert-based model in three different integrated care contexts in The Netherlands: stroke, acute myocardial infarction, (AMI), and dementia services. Our research question is:

> *To what extent are the elements of the Development Model for Integrated Care relevant to and implemented in the integrated care practices for stroke, acute myocardial infarction, and dementia patients?*

Introduction to integrated stroke, AMI, and dementia care

In the Netherlands, with its population of 16 million people, every year about 41,000 people suffer from a stroke. In 2005 22% of the people with a stroke died within one year after their hospital admission [32]. A large number of disciplines and health care providers are involved in stroke care, which consists of three phases. In the acute phase general practitioners, ambulances and hospitals (the emergency department and the stroke unit) are involved. In the rehabilitation phase rehabilitation centres, nursing homes and home care organizations are the care providers. While informal care and patient federations are relevant during the whole care continuum, they become even more important in the chronic phase to support the patients and their families. 'Stroke services' have existed in The Netherlands since the late 1990s and are organized as a network of service providers working together in a structured way to provide adequate services in all stages of the follow-up care for stroke patients [33]. During the last ten years there have been multiple projects to stimulate the development of regional stroke services in The Netherlands. Examples are the Breakthrough Collaboratives, the development of a national indicator set and a stroke benchmark, updated stroke guidelines, and the start of the National Stroke Service Network [34, 35]. Nevertheless, there is still room for improvement, while bottlenecks are observed in issues such as the exchange of (electronic record) information among professionals, accurate services in the chronic phase, and the absence of integral financial budgets.

Each year, 36,000 patients suffer from AMI in The Netherlands. Here, approximately 25% of the patients die before reaching the hospital [36]. The current standard treatment for AMI patients is primary percutaneous coronary intervention (PCI), which requires a quick transfer of the patient to a hospital with interventional capacities. International guidelines state that the time interval between the first medical contact and the start of the treatment should not be longer than 90-120 minutes [37]. Given that not every hospital is equipped with interventional capacities, close collaboration is necessary to ensure optimal patient flows through the care chain. The different care providers have made agreements on pre-hospital diagnosis, direct transfer to a catheterization laboratory, bypassing general hospitals and emergency departments, and post intervention patient management. Examples of these care providers are ambulance services, cardiac care units, catheterization laboratories in PCI centres, interventional and general cardiologists, and general practitioners. However, most agreements are made on an operational level between only two parties. Further applying the concept of integrated care services to acute cardiology may therefore help create a care system that offers more consensus among the parties, thereby providing a better understanding of the role of each health care provider. The past years, the number of hospitals with PCI capacities and acute care facilities for AMI patients has increased. This development can be considered as a challenge for the existing care systems to incorporate additional parties into the current agreements.

The number of people with dementia is rapidly increasing in The Netherlands. Nowadays there are 230,000 dementia patients, while this number will have increased to 550,000 by 2050 [38]. Dementia care is divided into three sectors: general care, mental health care, and long-term care. During the onset and early stages of dementia care, support is mostly provided by primary care practitioners, spouses, relatives and patient federations. For medical diagnostics general practitioners can refer to a hospital's specialist memory clinic or to mental health services. After the diagnosis, local services determine the specific care packages, such as case management, support groups, housekeeping, personal care, respite care or counseling. When living at home is no longer possible, sheltered housing or elderly people wards in nursing homes are options. The past five years the development of integrated dementia care networks has gained a lot of attention. Initiatives to stimulate the integrated dementia care in The Netherlands are the National Dementia Program, the Dementia Front Runner Program (integrated financial budgets), the widespread establishment of local Alzheimer federations, a national dementia indicator set, and the start of the development of a national care standard for dementia [39]. Nevertheless, there is still much room for improvement in this sector. Examples are the early detection of the disease, support after the diagnosis, the implementation and financing of case management, crisis intervention, coordination, timely referrals, and adequate support for the spouses and families.

Methods

To assess the relevance and implementation of the elements of integrated care, we constructed a survey study, based on the Development Model for Integrated Care. We had already designed the Development Model for Integrated Care in two previous studies [16, 17] by combining a structured literature study, a Delphi study, and a Concept Mapping study. The literature study of integrated care elements resulted in 101 items. Each element represents an activity aimed at the development (realization, improvement, innovation or sustainability) of integrated care. The Pubmed and Cochrane databases were searched for recent reviews, articles, and multiple other sources, such as PhD theses, evaluation reports, while frequently used quality management models were also studied. After the literature study, we conducted a Delphi study. During three rounds, 31 experts on integrated care rated the importance of the 101 elements by using an ordinal scale (range: 1=not important; 4=very important). Next, they improved, completed and confined the list of elements. Each included element was rated by at least 80% of the experts as (very) important for integrated care. This systematic approach resulted in 89 elements of integrated care, grouped in nine clusters. For the grouping procedure Concept Mapping was used. The individual clustering of the experts served as input for multidimensional scaling and hierarchical cluster analysis, resulting in a cluster map with nine clusters of 3 to 18 elements.

For the present study we constructed an Excel-based questionnaire. The first part (A) of the questionnaire focused on general information about the integrated care practice, such as the year when the collaboration had started, the number of patients in the year prior to that year, the number and type of health care providers involved, the current agreements among the care providers, infrastructures for cooperation improvement, the availability of a coordinator on the care chain level, and the commitment on a strategic level. The second part of the questionnaire (B) concerned the clusters and elements of the model. The respondents were asked to rate whether each element was relevant to their specific integrated care practice (yes=1, no=0) and if so, whether and in which year this element was implemented. The maximum relevance score on a cluster level for the total group was 1, the elements having equal weights. If elements were not implemented, there was an option by which to indicate that there were intentions to implement this element shortly (this year or the next). At the end of section B respondents had the option to add general comments or make suggestions for missing elements. Project ßleaders or coordinators of integrated stroke services as well as AMI and dementia care networks were invited to fill in the questionnaire. To assure that the right respondents took part, we clearly explained the criteria for participation via personal contact or sometimes by visiting them. The rationale for investigating these three different patient groups was based on multiple criteria. Firstly, we wanted variance among the participating integrated care services to assess the generalizability of the model. This variety had to apply to both the different client groups and their different care providers from the various sectors (acute care, chronic care, and social care). The AMI group has a strong focus on acute care settings, while the stroke group covers the entire continuum from acute to chronic care. The slow and progressive syndrome of dementia also includes mental health care and social care. Next, to include integrated care services in different stages of development, the years had to vary when the integration had been started. This was indeed the case for the three groups: dementia has only more recently received attention in The Netherlands, whereas AMI and stroke services have already been offered for a longer period of time. Another criterion was the inclusion of collaborative national networks that were willing to stimulate participation. The National Stroke Service Network, the National Network on Dementia, and the National Society for Trauma Centers all recommended participation in a letter to their members. Another criterion was geographical spread. This criterion was met since the national networks operate in most parts of the country. Finally, a coordinator on the tactical level was required. In all three sectors this criterion was met by a majority of the integrated care services. We contacted these coordinators and asked for their participation in the study. Each service was asked to fill in one questionnaire. The criteria for the respondents were that they had a good overview of the current state, history, and future plans of the integrated care service as a whole. The respondents had to participate on behalf of all integrated care providers involved and were allowed to contact colleagues in their integrated care setting to help them answer the questions. For this study, no ethical approval was needed. The collected data did not address any individual nor group wise patient data. The focus was on organisational aspects of integrated care (the 89 elements) which were delivered on a voluntary basis by the integrated care coordinators.

Ultimately 36 stroke services, 50 dementia care networks, and 12 myocard services were invited to participate in our study. Upon acceptation of our invitation, the respondents received the Excel-based questionnaire and an instruction sheet by e-mail. Non-responders were reminded twice, by telephone and by e-mail. Due to its smaller scale, the organizations in the AMI service sectors were visited beforehand by one of the researchers to introduce them to the questionnaire. Non-responders to our first call were telephoned by the researchers to explain the purpose of the study, after which they asked again for their participation. If indicated on the questionnaire, the reasons for the non-response as well as additional remarks were documented. The data analyses were executed per service and for the total group by means of descriptive statistics, frequency analyses, Chi Square, ANOVA and Kruskal-Wallis H, using SPSS software, version 16.0.

Results

Participating integrated care services

The overall response rate to the questionnaire was 83%; 32 of the 36 stroke services participated (89%), 9 of the 12 AMI services (75%) and 43 of the 50 dementia services (86%). Reasons for non-response were a lack of time to answer the questionnaire or absense of the coordinator. Respondents stated that filling in the questionnaire took about 30 to 45 minutes. Table 1 contains the characteristics of the participating integrated care services. The average year when integrated care was first started ranged between 2001 (stroke) and 2007 (dementia). The average number of stroke patients who entered the stroke services in 2008 was 449 ± 340 (range 134-1914). For the AMI group on average 1109 ± 515 patients (range 519-2200) entered the care chain in 2008. For dementia there were no central databases available that indicated the total number of clients per integrated care service. This was because multiple providers can start this care segment. All three services collaborated with hospitals, nursing and elderly homes, home care organizations, and general practitioners in a large number of the cases. Municipalities were involved in a minority of the stroke services (13%), in 72% of the dementia networks, but not in the AMI services. The percentage of services having periodical meetings with the financial bodies involved varied. Meetings with health insurers were held by 19% of the stroke, 11% of the AMI, and 28% of the dementia services. Health insurers are mainly focused on the cure sector, as the long-term care is organized differently in The Netherlands. Insurance companies divide the country into 32 regions, and in each region the largest one acts on behalf of all others as the regional contractor and finance body of the long-term care providers. Regular meetings with these bodies were common for 28% of the stroke, 11% of the AMI, and 93% of the dementia services. Long-term care clients require a needs assessment report from an independent organization before they can receive care from a provider. Twenty five percent of the stroke and 14% of the dementia services had regular contact with these organizations, which did not apply to the AMI services.

Table 1. Characteristics of participating integrated care services

Characteristic	**Stroke n=32**	**AMI n=9**	**Dementia n=43**
Average start year (min – max)	*2001 (1996–2005)*	*2003 (1998–2004)*	*2007 (2000–2010)*
Average lifespan in years (sd)	*7.75 ± 2.4*	*5.67 ± .2.0*	*2.72 ± 2.1*
Involved care providers (% of n):			
– hospitals	*100%*	*100%*	*91%*
– expertise center	*–*	*–*	*47%*
– mental health care	*0%*	*0%*	*98%*
– rehabilitation center	*88%*	*0%*	*0%*
– nursing and elderly homes	*100%*	*11%*	*100%*
– home care	*100%*	*0%*	*100%*
– welfare/social care	*–*	*0%*	*77%*
– client organisation	*38%*	*0%*	*98%*
– municipality	*13%*	*0%*	*72%*
Agreements available with: (% of n)			
– general practitioners	*72%*	*89%*	*56%*
– ambulances	*78%*	*100%*	*0%*
% with integrated care coördinator	*78%*	*33%*	*96%*
Average hours per week (min-max)	*5.5 (0–19)*	*2.0 (1.5–2.4)*	*15.0 (2–36)*
% with improvement teams on care chain level, consisting of	*91%*	*78%*	*91%*
– professionals	*3%*	*100%*	*13%*
– managers	*3%*	*0%*	*3%*
– mixed	*93%*	*0%*	*85%*
% with formal collaboration agreement between involved providers	*69%*	*22%*	*84%*
% with regular board meetings of involved providers	*78%*	*67%*	*95%*

Relevance of the elements

For all 89 elements relevance scores (RS) were calculated. Overall, the relevance of the elements was high in the case of all three integrated care settings. As regards stroke and dementia, all elements could be classified as relevant at a cut-off point of 80%, as in our previous Delphi study (see figure 1). For the AMI services 13 elements scored lower than 80%. Six of these were assessed as relevant by 78% of the respondents. Four elements scored lower than 50%, namely 'developing care programmes for relevant client subgroups'(44%); 'developing criteria for assessing clients' urgency' (33%); 'reaching agreements among care partners on scheduling client examinations and treatment' (22%) and 'reaching agreements among care partners on providing care to waiting-list clients' (11%). For the total group the relevance scores on a cluster level were between 0.9 and 1, which meant high relevance scores for all clusters. For the three subgroups, the scores ranged between 0.98 and 1.0 (stroke); 0.78 and 1.0 (AMI) and 0.95 and 0.99 (dementia), see also table 2. Three of the respondents named a missing element after finishing the questionnaire, but the elements were very close related to those already in the set.

Table 2. Relevance scores per cluster

Cluster (nr of elements)	**Total**	**Stroke**	**AMI**	**Dementia**
1. Client centeredness (9)	0.93	0.98	0.83	0.98
1		7	3	5
0.9 – 1		1	0	4
0.8 – 0.89		1	2	0
<0.8		0	4	0
2. Delivery system (18)	0.90	0.98	0.78	0.95
1		12	8	5
0.9 – 1		6	0	11
0.8 – 0.89		0	3	2
<0.8		0	7	0
3. Performance management (16)	0.98	0.99	1.0	0.95
1		13	16	0
0.9 – 1		3	0	14
0.8 – 0.89		0	0	3
<0.8		0	0	0
4. Quality care (5)	0.95	0.99	0.91	0.96
1		4	2	1
0.9 – 1		1	0	4
0.8 – 0.89		0	2	0
<0.8		0	1	0
5. Result-focused learning (12)	0.99	0.99	1.0	0.97
1		12	12	1
0.9 – 1		8	0	11
0.8 – 0.89		0	0	0
<0.8		0	0	0
6. Interprofessional teamwork (3)	0.99	0.99	1.0	0.98
1		2	3	1
0.9 – 1		1	0	2
0.8 – 0.89		0	0	0
<0.8		0	0	0

Table 2. (Continued)

7. Roles and tasks (8)	*0.99*	*1.0*	*0.99*	*0.97*
1		*8*	*7*	*0*
0.9 – 1		*0*	*0*	*8*
0.8 – 0.89		*0*	*1*	*0*
<0.8		*0*	*0*	*0*
8. Commitment (11)	*0.99*	*0.99*	*0.99*	*0.99*
1		*9*	*10*	*8*
0.9 – 1		*2*	*0*	*3*
0.8 – 0.89		*0*	*1*	*0*
<0.8		*0*	*0*	*0*
9. Transparant entrepreneurship (7)	*0.98*	*1.0*	*0.95*	*0.99*
1		*7*	*5*	*5*
0.9 – 1		*0*	*0*	*2*
0.8 – 0.89		*0*	*1*	*0*
<0.8		*0*	*1*	*0*

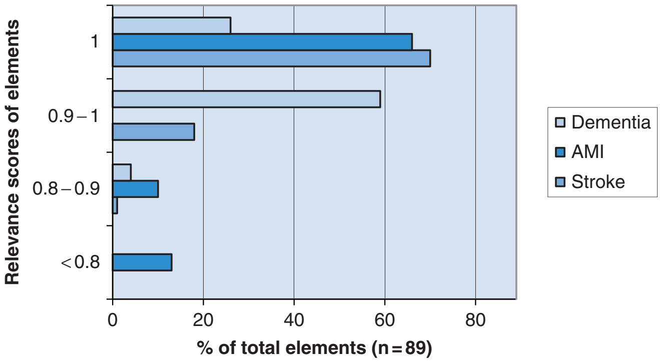
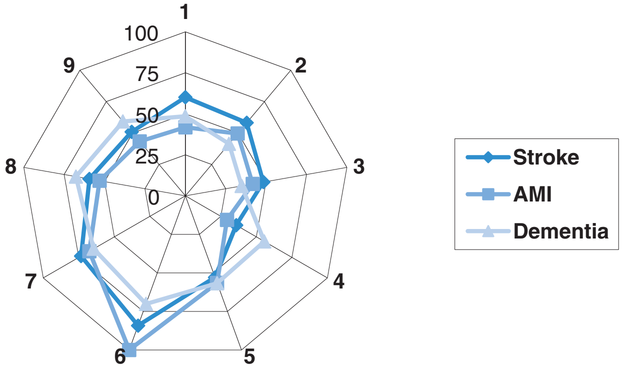


Figure 1. Relevance scores of elements

Implementation of the elements

The number of implemented elements of the Development model for Integrated Care varied within and among the three services. The average number of elements (maximum 89) for the total group was 46 ± 20 items (range 3-82). For the three subgroups, the amounts ranged from 50 ± 18 (10-77) elements for stroke, 42 ± 13

(20-61) elements for AMI, and 45 ± 22 (3-82) for dementia. Figure 2 gives an overview of the percentages of the implemented elements per cluster that were rated as relevant by the respondents. For the total group, the mean percentages of these elements were the highest in the 'inter-professional teamwork' (85 ± 29) and in the 'roles and tasks' clusters (69 ± 29). The implemented elements with the lowest relevance percentages were found in the clusters 'quality care' (40 ± 24) and 'performance management' (42 ± 30). The mean numbers of the elements marked as 'planned for the near future' differed significantly among the stroke, AMI, and dementia services (respectively 8, 4 and 21, p<0.001). When we look at the timespan of the implemented elements, the dementia services show the most recent dates, with most elements implemented between 2007 and 2009. For both stroke and AMI most elements were implemented between 2002 and 2006. Analyses of the correlation between the relevance scores of elements and the implemented elements showed no correlation (r = -0.02, p ≥0,10). Additional file 1 presents the implementation scores, the average year of implementation, and the percentages of the plans for working on the elements.



Legend of the cluster names:

1 = patient-centeredness
2 = delivery system
3 = performance management
4 = quality of care
5 = result-focused learning
6 = interprofessional teamwork
7 = roles and tasks
8 = commitment
9 = transparant entrepreneurship

Figure 2. Percentage of relevant implemented elements per cluster

Discussion

The results of this study indicate that the integrated care practice widely recognizes the Development Model for Integrated Care with its evidence- and expert-based elements and clusters. Regardless of the differences among the three integrated care services (stroke, AMI, and dementia patients) who differed in age, client groups, size, focus on either acute or chronic care, collaboration infrastructure, and the care providers involved, they all rated the elements of the Development model for Integrated Care as highly relevant. Based on these results we may conclude that the empirical test of our theoretical model has been successful and that this tool has the potential to effectively support multiple integrated care practices.

In addition to the useful information gathered regarding the relevance and implementation of the elements of integrated care, a large number of respondents gave feedback on the model's applicability. The integrated care coordinators indicated that filling in the questionnaire was a good exercise to reflect upon the current situation. Discussing the implementation of the elements gave new ideas for the improvement and further development of their integrated care practice. The respondents used the elements and clusters for their quality management systems, improvement plans or even wrote a discussion paper for their steering committee based on the questionnaire results. Although the relevance scores were all (very) high, some important differences were observed among the nine clusters. For the AMI services three elements of cluster 2 ('delivery system') had the lowest relevance scores (<50%). The average priority score of these four elements was 1.94, which is markedly lower than the average of 2.23 of the whole set (see also additional file 1). When analyzing the content of these elements, however, it made sense that 'providing care to waiting list patients' and 'criteria for urgency' do not apply to this client group, since these items are associated with the provision of acute care. 'Providing case management', another low scoring element in the case of AMI services, generally applies to clients who need multidisciplinary care during a prolonged period of time. Case management is one of the crucial interventions currently implemented in The Netherlands for dementia patients [40]. This situation corresponds with our study findings; a large number of services have already implemented case management or are planning on introducing this approach.

It can be concluded that integrated care settings are generally still in a developmental stage. Especially in the dementia services, the number of planned elements is high. On average half of the elements identified have been implemented in practice. And within all three service groups the integrated care services vary in their plans and implementation rates. The absence of correlations between the relevance scores of implemented elements and their implementation rates could be explained by the overall high scores with little variation between relevant scores. It assumes that choices for interventions are influenced by other factors like possibly the amount of development or 'maturity' of the integrated care service. In an earlier, more conceptual study [31] we concluded that integrated care services can experience different phases of development which are called: 'the initiative and design phase', 'the experimental and execution phase', 'the expansion and monitoring phase' and 'the consolidation and transformation phase'. It would be interesting to further research a possible relation between the phases of development and the implementation rates. The AMI services are strongly focused on the professional and more practical level, as illustrated by high scores in the clusters 'inter-professional teamwork' and 'roles and tasks', which refer to the earlier phases of development. Since the AMI-services have not included the rehabilitation phase after an infarction, the next step may be the expansion to a full service. In this case, the AMI services would also be faced with some of the bottlenecks typical of the later phases of development, such as separate financial systems and the need for formal agreements among providers. However, AMI has not yet made many plans in this direction. This situation may be explained by the absence of a coordinator in the majority of the AMI organizations.

The stroke service provides a broad spectrum of integrated care consisting of a substantial number of integrated care elements. Although stroke represents one of the first and 'oldest' patient groups for which integrated care was developed on a large scale, some of its activities still seem to be in their initial stage. Elements from the clusters 'performance management' and 'quality care' have not been implemented on a large scale yet. Especially the elements associated with monitoring the quality and results of the care chain and the involvement of clients in assessing their needs and judgements have not yet received sufficient attention. In addition, incentives on a governmental level to further develop these activities are lacking, as there are still no financial or professional stimuli included in the policies for the integrated stroke care in the Netherlands. Despite this fact, the post-stroke mortality rate declined by 25% during the period 2000 – 2005, which is believed to be a result of the introduction of stroke services and more precise diagnostics and treatment approaches [41].

Dementia services were initiated significantly later than stroke and AMI, but the number of elements already implemented indicates that this segment has developed rapidly during the past years. This process is accompanied by a focus on integrated budgets, experiments, and formal agreements (as indicated in cluster 9). We assume that national initiatives, such as the National Dementia Program, the Front Runner Program, and a strong nationwide network of client federations have accelerated the development of this service. In addition, there are many plans for the near future, which has raised the expectation for the coming years. The newness of the concept of integrated care to the people working in the dementia sector may stimulate their enthusiasm in making plans to further develop the service. In other words, the biggest growth of the system possibly lies in the beginning of it.

Study limitations

Our study has some limitations. First, the number of research participants per patient group differed, which was due to the nature of the current situation. The AMI services were only represented by nine of the twelve services because the number of hospitals with interventional capacities was limited, which means that there were only a few networks. The treatment of a stroke, however, can be initiated in almost any hospital. Second, although a number of respondents consulted partners in the care chain when filling in the questionnaire, it would be interesting to invite more care workers in the three integrated care service to add additional perspectives. Third, the respondents' answers were based on self-reported data. Whenever elements were implemented, these decisions were based on the judgement of the integrated care service representatives themselves without consulting other sources, such as documentation or interviews. Finally, we focused our research on integrated care services in the Netherlands, while it would also be interesting to expand this study internationally.

Recommendations for research and practice

We have multiple suggestions for further research to further assess the generalizability of the model. Firstly, we suggest to broaden the assessment of the implemented elements by involving multiple professionals, managers and also client representatives per integrated care setting. Adding these perspectives can provide interesting information about how the implementation is being experienced and if consensus is available. Secondly, we suggest repeating the study in integrated care services which focus on other client groups like for instance clients with diabetes, COPD, depression or other groups like frail elderly who need support on broader life domains. This kind of research could provide knowledge about the further applicability of the model, because of our aim was to develop a generic model. A third option could be expanding our research to other countries. Next to changes on the 'meso- or organisational level' of integrated care where our research focuses on, than 'also macro- or system level' characteristics and differences are being taken into account. These characteristics address for instance other political, demographical, legal and professional or educational contexts.

Another suggestion is further research on the different phases of development of integrated care services and the implemented elements in each phase. Previous research revealed different phases of development, but the relation between these phases and the implementation of elements in each phase is less clear. Also, the implementation process of the elements asks for different roles, needed expertises and strategies of integrated care coordinators, professionals and managers. These are interesting topics for further research. Finally, we suggest follow-up research on the relation between the implementation of the elements and clusters of the

DMIC and the delivered results. Do more 'mature' integrated care practices or practices that implemented more elements achieve better results in quality of care, quality of life, client related indicators (or client experiences) and costs?

Our study has a number of practical implications. Coordinators and managers may use the Development model for Integrated Care as a quality management tool in their integrated care practices. The model with its elements and clusters is suitable for different patients groups and can be used as an assessment instrument to monitor the integrated care activities. Moreover, the respondents indicated that the model also worked as a self-evaluation tool and helped them in the formulation of improvement plans. Further use in practice could be enhanced by developing a DMIC-based user-friendly (web based) tool, in which not only integrated care coordinators but also multiple partners working in integrated care services could score the elements on relevance and implementation. By presenting the (consensus) results found, clusters and elements with lower scores could be further discussed and prioritised as a basis for an improvement plan. Managers can use the model in broadening their vision on integrated care and improving their quality management. Furthermore, the model can be used for benchmarking by comparing the (absolute) implementation scores between integrated care practices. Practices can mirror their own results with comparable others and get input for improvement activities. The National Stroke Service network has plans to use the model for auditing its stroke services in The Netherlands in the coming years.

Conclusion

This study has assessed the practical relevance and implementation of the Development Model for Integrated Care, consisting of nine clusters with in total 89 elements, in three integrated care settings: AMI, stroke, and dementia. These segments varied considerably. The AMI services can be characterized as acute care, while stroke services range from acute to chronic care. Finally, the dementia services merely focus on chronic care. In all three integrated care settings the relevance of the elements was considered high. We can therefore conclude that the Development Model for Integrated Care has a generic character and can serve as a useful tool for assessment, evaluation or improvement in both the research on integrated care and its development in the practical field.

In addition, the study has provided a detailed analysis to what extent integrated care has been implemented within each service and on which topics. The average number of implemented elements was 50 ± 18, 42 ± 13, and 45 ± 22 for stroke, acute myocardial infarction, and dementia care services, respectively. Although the dementia services were significantly newer, the number of implemented elements was comparable to that of the other segments. The average number of planned elements told us that the integrated care services are still developing, although the intensity differs significantly among the three groups. With respect to new initiatives and plans the dementia services take the lead, which might be explained by the national initiatives and incentives in this area and the actions of client federations. Research to further assess the generalizability of the model for other (international) client groups and the relation between integrated care development and the DMIC elements is suggested.

Acknowledgements

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Additional file 1 – Implementation of integrated care elements

This file presents the percentages of implemented elements (PI), the average year of implementation (Ayr), and the percentage of planned elements (PP) of services which have not implemented the element yet. The data were gathered from 32 stroke service (Str), nine AMI-services, and 43 dementia services. PI is based on attainable elements: attainable elements are all services minus those which rated the element as not relevant (see also table 2 for relevance scores).
The elements per cluster were ranked by priority scores (PS). These were systematically assessed by an expert panel as described in Minkman et al. 2009 [16].
Maximum priority score is 3.
Md=missing data

Cluster 1. Patient-centeredness, 9 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.66	88	75	2004	71	0	2005	77	70	2009	Providing understandable and client-centered information
2.36	61	25	2004	0	11		52	75	2008	Collaboratively offering client information of the care partners
2.35	69	10	2004	63	0	2005	60	24	2008	Designing care for clients with multi- or co-morbidities
2.31	44	28	2005	33	0	2007	40	38	2007	Using self-management support methods as a part of integrated care
2.23	56	36	2002	50	0	2005	26	66	2008	Implementing care process-supporting clinical information systems
2.13	81	0	2003	57	0	2005	61	10	2008	Flexible adjustment of integrated care corresponding to individual clients' needs
2.10	36	33	2004	0	0		48	67	2008	Developing a front office: single entry point for client information
1.97	63	67	2004	67	0	2002	48	77	2008	Using a protocol for the systematic follow-up of clients
1.94	41	21	2005	50	0	2006	26	52	2007	Developing care programmes for relevant client subgroups
Cluster description										This cluster is aimed at developing integrated care and information flows tailored to specific (sub)groups of patients. The elements focus on providing information on integrated patient and care process support (front offices, self-management support or information systems), and on delivering care adjusted to individual needs (e.g. multi-morbidity).

Cluster 2. Delivery system, 18 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.94	97	100	2002	100	0	2004	65	93	2008	Reaching agreements on referrals and the transfer of clients through the care chain
2.84	88	50	2003	56	0	2004	43	96	2008	Reaching agreements on procedures for information exchange
2.71	41	42	2005	0	29		13	54	2009	Using a single client-monitoring record accessible to all care partners
2.46	77	57	2001	78	0	2004	51	90	2008	Reaching agreements on procedures for the exchange of client information
2.42	13	31	2008	11	38	2008	5	46	2010	Developing connections with the databases of partners in the care chain
2.38	22	8	2003	0	0		81	88	2009	Offering case management to clients with complex needs
2.32	88	75	2003	78	0	2003	38	58	2007	Reaching agreements on chain logistics (e.g. waiting periods and throughput times)
2.32	19	12	2005	20	0	2008	30	61	2009	Using shared client treatment and care plans
2.26	31	25	2004	13	29	1990	13	43	2008	Using uniform client-identification numbers within the care chain
2.19	59	38	2003	89	0	2003	56	89	2007	Reaching agreements among care partners on the consultation of experts and professionals
2.07	66	0	2003	57	0	2004	41	52	2007	Reaching agreements among care partners on managing client preferences
2.06	91	0	2001	50	0	1998	53	50	2009	Reaching agreements among care partners on scheduling client examinations and treatment
2.05	81	0	2002	78	0	2003	32	38	2008	Reaching agreements among care partners on discharge planning
2.00	94	100	2002	88	0	2002	57	44	2008	Developing criteria for the inclusion and throughput of clients in the care chain
1.97	28	0	2003	0	0		38	57	2007	Reaching agreements among care partners on providing care to waiting-list clients
1.95	39	16	2002	0	0		54	42	2007	Deploying specialized nurses within the care chain

Cluster 2. (Continued)

1.94	63	25	2002	38	0	2005	41	43	2008	Reaching agreements on linking clients to outside resources or community care partners
1.79	47	6	2002	67	0	1999	27	47	2005	Developing criteria for assessing clients' urgency
Cluster description										Chain and client logistics, coordination mechanisms and procedures for streamlining the care process for the whole care chain is the main focus of this cluster. Further objectives are reaching consensus regarding all agreements (e.g. logistics, sharing expertise), procedures (e.g. information exchange) or tools (e.g. care plans) required from the client's initial entry into the care chain until the final phase.

Cluster 3. Performance management, 16 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.55	84	60	2003	67	33	2005	45	65	2009	Defining performance indicators to evaluate the results of the integrated care delivered
2.50	72	11	2004	78	50	2004	44	65	2007	Providing feedback to care partners on transfers
2.44	47	35	2004	44	60	2000	28	45	2007	Gathering client-related performance data (health status, quality of life)
2.42	88	75	2004	67	33	2002	50	76	2009	Gathering data on client logistics (e.g. volumes, waiting periods and throughput times) in the care chain
2.41	47	6	2004	56	0	2005	39	44	2007	Using feedback and reminders by professionals for improving care
2.40	50	25	2006	33	50	2007	18	64	2009	Reaching agreements about the uniform use of performance indicators in the care chain

Cluster 3. (Continued)

2.39	47	35	2003	33	17	2004	60	65	2009	Monitoring successes and results during the development of the integrated care chain
2.33	48	38	2004	22	14	2004	17	66	2009	Establishing quality targets for the performance of the whole care chain
2.32	3	10	md	33	0	2006	13	24	2007	Monitoring and analyzing mistakes/near mistakes in the care chain
2.27	39	30	2004	11	25	2008	38	58	2009	Using a systematic procedure for the evaluation of agreements, approaches and results
2.25	16	33	2005	0	11		38	77	2009	Monitoring client judgements and satisfaction for the whole care chain
2.23	13	18	2006	11	0	2004	31	66	2009	Gathering financial performance data of the care chain
2.19	31	9	2004	11	13	2008	17	35	2009	Making transparent the effects of the collaboration on the production of the care partners
2.19	56	36	2004	89	0	2004	27	48	2006	Monitoring whether the care delivered corresponds with the evidence-based guidelines
2.18	50	31	2003	33	50	2004	17	51	2009	Establishing quality targets for the performance of care partners
1.98	81	17	2004	78	0	2007	74	55	2009	Installing improvement teams at the care-chain level
Cluster description										Measurement and analyses of the results of the care delivered in the care chain is the central theme of this cluster. The elements address performance targets at all levels, monitored by the standardized use of indicators. The indicators refer to client outcomes, client judgments, organizational outcomes, and financial performance data. (Near) mistake analysis, feedback mechanisms and improvement teams are used to improve and manage the level of performance

Cluster 4. Quality care, 5 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.65	13	11	2004	0	14		46	45	2008	Systematically assessing the needs of the clients in the care chain
2.55	44	33	2004	33	17	2004	24	55	2007	Developing a multidisciplinary care pathway
2.43	28	30	2005	0	13		81	63	2009	Involving client representatives in improvement projects in the care chain
2.40	66	45	2004	100	0	2004	50	60	2007	Using evidence-based guidelines and standards
2.12	28	22	2005	0	13		74	64	2008	Involving client representatives in monitoring the performance of the care chain
Cluster description										This cluster contains elements that focus on the design of a multidisciplinary care pathway throughout the care chain, based on evidence-based guidelines and standards, as well as clients' needs and preferences. For this purpose a needs assessment of the specific client group is required, combined with the involvement of client representatives in designing, improving, and monitoring the integrated care.

Cluster 5. Result-focused learning, 12 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.37	68	30	2003	67	33	2006	79	44	2007	Stimulating a learning culture and continuous improvement in the care chain
2.27	56	0	2004	78	0	2005	62	0	2009	Defining and assessing the characteristics of the collaboratively delivered care
2.26	38	15	2003	22	0	2008	38	38	2008	Making the benefits of the collaboration transparent for each care-chain partner
2.23	84	40	2004	78	0	2007	79	89	2008	Collaboratively assessing bottlenecks and gaps in care
2.17	56	29	2004	89	0	2006	62	75	2008	Sharing knowledge among care partners about effectively organizing sustainable integrated care
2.16	74	13	2003	67	33	2007	80	44	2007	Striving toward an open culture for discussing possible improvements for care partners
2.14	61	8	2004	67	33	2006	76	50	2008	Learning by the exchange of information among professionals about the care process
2.13	3	6	2000	11	0	2008	12	33	2008	Integrating incentives for rewarding the achievement of quality targets
2.11	44	0	2002	78	0	2004	57	44	2008	Using knowledge and information for directing and coordinating the care chain
2.11	69	50	2003	44	40	2004	52	35	2008	Introducing collaborative education programmes and learning environments for the care professionals
2.03	13	14	2002	22	14	2004	17	38	2008	Linking consequences to the achievement of goals agreed upon
1.88	71	11	2003	56	25	2006	64	47	2009	Collaborative learning in the care chain in order to innovate integrated care
Cluster description										The central theme of this cluster is establishing a learning climate aimed at continuously improving the results in the care chain The elements address essential ingredients for improvement: defining goals for collaboration, identifying bottlenecks and gaps in care, and ways of learning and exchanging knowledge in an open atmosphere. Incentives are used to reward improved performance.

Cluster 6. Interprofessional teamwork, 3 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.61	90	33	2003	100	0	2004	86	50	2007	Defining the targeted client group
2.26	100	0	2001	100	0	2004	67	57	2008	Working in multidisciplinary teams
2.04	63	25	2003	100	0	2004	59	65	2007	Reaching agreements on the availability and accessibility of professionals
Cluster description										This cluster represents interprofessional teamwork for a well-defined client group. This client group forms the target of the collaborating professionals, who work in well-organized multidisciplinary teams in the care chain.

Cluster 7. Roles and tasks, 8 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.55	78	29	2003	67	33	2006	69	69	2008	Reaching agreements among care partners on tasks, responsibilities and authorizations
2.55	91	33	2002	89	0	2006	76	80	2009	Achieving adjustments among care partners by means of direct contact
2.36	84	0	2003	89	0	2007	64	87	2009	Ensuring that professionals in the care chain are informed of one another's expertise and tasks
2.20	78	29	2005	56	25	2006	83	71	2008	Installing a coordinator working at the chain-care level
2.18	75	13	2002	78	0	2006	52	50	2008	Establishing the roles and tasks of multidisciplinary team members
2.13	69	20	2004	78	0	2006	71	67	2008	Realizing direct contact among professionals in the care chain

Cluster 7. (Continued)

2.07	34	33	2003	25	0	2004	24	59	2007	Reaching agreements on introducing and integrating new partners in the care chain
2.05	78	29	2003	56	0	2007	80	50	2008	Directing the care chain by appointing a limited number of people with coordinating tasks
Cluster description										This cluster reflects the need for clarity about one another's expertise, roles and tasks in the care chain. The main target issues are an effective collaboration at all levels with (new) partners and a proper allocation of the coordinating tasks.

Cluster 8. Commitment, 11 elements

PS	**Str PI**	**Str PP**	**Str Ayr**	**Myo PI**	**Myo PP**	**Myo Ayr**	**Dem PI**	**Dem PP**	**Dem Ayr**	**Element description**
2.49	81	50	2004	67	0	2006	81	88	2008	Defining the ambitions and aims of the collaboration in the care chain
2.43	72	44	2003	44	40	2006	69	92	2009	Signing collaboration agreements among the care partners
2.40	84	80	2003	67	0	2007	71	83	2008	Assuring the leadership commitment of the partners involved in the care chain
2.29	38	30	2006	22	0	2007	58	50	2009	Describing the tasks and authorities of leaders, coordinators and advisory boards in the care chain
2.19	50	25	2003	56	25	2006	48	38	2009	Establishing dependencies among care partners
2.17	72	44	2003	56	0	2006	72	67	2009	Guiding the care chain by emphasizing a collaborative commitment

Cluster 8. (Continued)

2.16	75	25	2003	67	0	2008	88	40	2008	Structural meetings of the leaders of the care-chain organizations
2.08	22	16	2005	56	25	2006	42	48	2008	Reaching agreements about letting go care partner domains
2.07	56	36	2005	56	0	2006	67	36	2007	Stimulating trust among care partners
2.04	90	33	2004	67	33	2006	70	69	2009	Stimulating the awareness of working in a care chain
1.91	13	15	2005	25	0	2007	77	50	2008	Structural meetings with external parties, such as insurers, local governments and inspectorates
Cluster description										This cluster's focus is on collaborative commitment and ambition in the care chain. In addition to the awareness of dependencies and domains, other target items are commitment toward clearly defined goals and a collaboration ambition. Other components are the general awareness of working in a care chain and the commitment of leaders in this trajectory.

Cluster 9. Transparent entrepreneurship, 7 elements

PS	Str PI	Str PP	Str Ayr	Myo PI	Myo PP	Myo Ayr	Dem PI	Dem PP	Dem Ayr	Element description
2.59	59	23	2004	44	0	2006	63	63	2009	Making a commitment to a joint responsibility for the final goals and results to be achieved
2.36	53	20	2003	89	0	2005	64	47	2008	Using a uniform language in the care chain
2.19	44	17	2004	0	0		65	73	2008	Reaching agreements on the financial budget for integrated care

Cluster 9. (Continued)

2.16	53	13	2004	11	0	2009	53	75	2009	Allocating financial budgets for the implementation and maintenance of integrated care
2.14	69	30	2003	67	0	2006	70	62	2009	Involving leaders in improvement efforts in the care chain
2.07	63	33	2004	78	0	2006	74	73	2008	Creating an open environment that encourages experiments and pilot projects
2.04	16	11	2005	0	0		24	56	2007	Offering a single collaborative financial contract to the financing parties through the collective of care partners
Cluster description										This cluster concentrates on room for innovation (experiments), leadership responsibilities for performance achievement, and joint financial agreements which cover the integrated care chain as a whole. The elements concern issues such as preconditions for entrepreneurship, including financial preconditions

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Chapter 8

Developing integrated care: a survey study to validate a four phases Development Model for Integrated care

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Developing integrated care: a survey study to validate a four phases Development Model for Integrated Care

Abstract

In this article the four phases of the Development Model for Integrated Care (DMIC), are validated in practice for stroke services, acute myocardial infarct (AMI) services and dementia services in the Netherlands. The development of integrated care is a complex and long term process that can be characterised by four development phases: the initiative and design phase; the experimental and execution phase; the expansion and monitoring phase and the consolidation and transformation phase. Based on the pre-study about the DMIC, a survey was developed for integrated care coordinators. In total 32 stroke, 9 AMI and 43 dementia services in the Netherlands participated (response 83 %). Data were collected on integrated care characteristics, planned and implemented integrated care elements, self-assessed development phases and factors that influence development. Data analysis was done by descriptive statistics, ANOVA, Kappa tests, Pearson's correlation and Kruskal-Wallis tests. All 84 stroke, AMI and dementia services positioned their practice in one of the four phases and confirmed the phase descriptions. Of them 93% confirmed to have lived through the previous phase. The number of implemented and planned elements increased respectively decreased through the four phases for all calculation methods. Pearson's correlation was .394 between implemented relevant elements and self-assessed phase, and up to .923 with the calculated phases ($p<.001$). Elements corresponding to the earlier phases of the model were on average older. Although the integrated care services differed on multiple characteristics, the DMIC development phases were confirmed. Integrated care development is characterised by a changing focus over time, often starting with a large amount of plans which decrease over time when progress on implementation has been made. Integrated care coordinators find the DMIC helpful to evaluate their integrated care and guide further development. The four phases model has the potential to serve as a generic quality management tool for multiple integrated care practices.

Background

Integrated care development

Numerous studies of integrated care define and discuss the interventions that need to be implemented in order to streamline care processes and organise collaboration between professionals and organisations [1-5]. Integrated care can be defined as a coherent and coordinated set of services, which are planned, managed and delivered to individual service-users across a range of organisations and by a range of cooperating professionals and informal care-givers [2]. Whereas the rationale for integrated care is evident, the developmental process for integrated care is less clear as it is a complex and long-term one. The integration of care can be complicated by different goals, different funding streams and different stakeholders or care providers.

In the literature about the development of organisations, numerous authors have described life cycle models, often with three to five phases [6-9]. Major organisational problems can generate the necessary urgency and activity for further development, resulting in another phase of the life cycle. Although there is no consensus about the number of phases and the phase definitions, there is a consensus that organisations change over time in order to survive important management problems [8].

The development of networks is another related area. A network is defined as a more or less stable pattern of social relations among different actors (people, groups or organisations). Network development is characterised by continuous restructuring and reshaping as a result of the actions, interactions and interpretations of the parties involved [5]. Because integrated care concerns health care organisations and their collaboration in differing degrees of intensity and in different appearances, these perspectives about organisational and network development are useful when researching the development of integrated care.

A four-phase development model

In a previous study [10,11] we developed a four-phase model for integrated care services (see also methods), namely the Development Model for Integrated Care [DMIC see table 1]. We performed a literature search on integrated care development and the findings were used by an expert panel to build the DMIC. The expert panel reached consensus that different phases of development can be identified in integrated care practice. For instance, some stroke services are already measuring the results of the care process and have reached agreements with the care providers involved, whereas others are still starting up the collaboration. The experts stressed that thinking in terms of phase-wise development is relatively new and that this is therefore still scarcely used by integrated care practitioners. Besides the four phases, the model consists of 89 elements of integrated care grouped in nine clusters. An element was defined as an activity focusing on the development (realisation, improvement, innovation of sustainability) of integrated care [10,11].

Table 1. The development phases of integrated care

PHASE 1 Initiative and design phase:
The collaboration between health care providers has been intensified or started up. The starting point is a common problem or chance occurrence, or builds on current cooperation among care professionals. There is a sense of urgency and there are possibilities for working on these challenges in collaboration. The targeted patient group, the care chain and care process have been defined, as also the needs of patients and stakeholders. The level of ambitions, motivation and leadership determine the progress achieved. A multidisciplinary team designs an experiment or project to execute the current ideas. The collaboration can be signed up to in an agreement among care partners.
Key words: Exploring possibilities/impossibilities, ambitions and chances, (project) design and collaboration agreements.

PHASE 2 Experimental and execution phase:
New initiatives or projects are being executed in the care chain. The aims, content, roles, and tasks in the care chain have been clarified and written down in care pathways and protocols. There is coordination at the level of the care chain by for instance installing coordinators or setting up meetings. Information about patient groups, working procedures or professional knowledge is exchanged. There are experiments within the collaboration, results are evaluated to learn from and reflect on. Preconditions for projects have been considered and boundary conditions have been solved by collaborative means or agreements among care providers.
Key words: Writing down aims and content of the collaboration, coordination at care chain level, experimenting and reflecting.

PHASE 3 Expansion and monitoring phase:
Projects have been expanded or integrated in integrated care programmes. Agreements on the content, tasks and roles within the care chain are clear and signed up. Collaboration is no longer on an informal basis. Results are systematically monitored and improvement areas identified. The targeted population has been surveyed. More collaborative initiatives emerge such as mutual education programmes. There is a continuous commitment to the ambition of the integrated care programme. Interorganisational barriers and fragmented financial structures are on the agenda of the care partners.
Key words: Further development and maturity, monitoring and improving results, new questions and innovation.

Table 1. (Continued)

PHASE 4 Consolidation and transformation phase: The integrated care programme is the regular way of working and providing care. Coordination at care chain level is operational; information is shared, transferred and fed back. A monitoring system periodically shows if results are being sustained, what specific improvement possibilities have been identified and to what extent patient needs have been met. The programme builds further on successful results. Organisational structures transform or are newly designed around the integrated care programme. Financial agreements are arranged with financers by means of integral contracts covering the care chain as a whole. Partners in the care chain explore new options for collaboration in the external environment with other partners. *Key words*: Continuous improvement, new ambitions, structures fitting the integrated care programme (organisational structures, integral financing).

In this model, the first phase was labelled the initiative and design phase, where a new chance occurrence initiated a new cooperative arrangement or a current arrangement is intensified. The care process and client group are defined. In the second experimental and execution phase, improvement plans and care pathways are implemented, and coordination mechanisms are arranged. In the third expansion and monitoring phase, roles and tasks have become clear and are formalised. The target population is monitored as well as the results of the integrated care. Once the integrated care programme has become the regular way of working, organisational structures are in process of transformation and integrated financial budgets have become a topic of discussion, the fourth consolidation and transformation phase has been reached.

Although the phase descriptions were developed in a structured way by the expert panel, they have not yet been validated in practice. Our aim in this study was to assess whether the four development phases were recognised by integrated care services in the Netherlands. For this empirical validation we selected three essentially different types of integrated care services: for patients with stroke, acute myocardial infarction (AMI) or dementia.

Our study questions were: *1. Are the conceptual development phases recognised in integrated care practice? 2. Is there a relationship between the development phases and (a) the number or age of implemented elements of integrated care or (b) the number of planned elements of integrated care? 3. What factors are crucial for moving to the next phase of development?*

Development of integrated stroke, AMI and dementia care in the Netherlands

To validate the four-phase model and to assess its generalisability, we researched three groups of integrated care services that vary on both quantitative as qualitative characteristics. Each year 41,000 people suffer from stroke, 36,000 from AMI and as many as 230,000 people are diagnosed with dementia in the Netherlands (out of 16.7 million inhabitants, of whom 15.6% are 65 or over) and these numbers will increase in the near future [12-14]. All three integrated care services are being developed among general practitioners, hospital care and ambulatory services. For stroke and AMI patients, acute care services play an important role. In the case of stroke services, rehabilitation centers, rehabilitation wards in nursing homes or home care organisations provide care after the patients are discharged from hospital. In dementia care mental health services, social care and informal services also play an important role. There are not only differences between these three groups of integrated care services, but within the groups regional characteristics such as the presence of providers and facilities (for instance a rehabilitation clinic) and earlier collaboration also influence the members involved in the service.

Another difference between these three patient groups is evident from their development history. Stroke services were one of the first integrated care services in the Netherlands and were first started up in the late 1990s. They are defined as a network of service-providers working together in an organised way to provide adequate services at all stages of the follow up care for stroke patients [15]. Stroke services worked on improving patient flows from hospitals to nursing homes and on improving information flows and the implementation of thrombolysis for acute ischaemic stroke patients [16-18]. Later on, care in the chronic phase and involving patients as partners became a focus. The development of AMI services started some years later and focused on arranging primary percutaneous coronary intervention (PCI) in a timely fashion, making agreements concerning pre-hospital diagnosis, arranging direct transfers to catheterisation laboratories (bypassing general hospitals and emergency departments), and post-intervention patient management. Nowadays they are working towards a better understanding of the role of each health care provider as part of the integrated care service, and are implementing continuous self-monitoring and improvement strategies [19]. The development of dementia care started only about five years ago in response to policy makers and client federations who were concerned about the fragmentation of dementia care. National initiatives like the National Dementia Programme and the Front Runner Programme were started up in 2005 and focused on a more active role for the general practitioner, more diagnostics and better and coherent care after diagnostics for both the patient and their care-givers. Other topics were the implementation of extensive case management, client and family involvement, a national dementia indicator set and the development of a method for financial agreements between providers and insurers in a specific region [20,21].

Methods

Pre-study

In a pre-study we constructed the Development Model for Integrated Care (DMIC) by means of a literature study, a three-round Delphi study with 31 experts, a Concept Mapping study and an additional questionnaire research [10, 11]. The four development phases, together with nine clusters and 89 elements, are components of the model. During a session with 27 highly qualified experts on integrated care, the experts reached consensus that integrated care development could be described in four phases. An additional questionnaire survey was performed (among 29 experts) to assess if the concept phase descriptions were recognised in practice by the experts. Analyses of the results showed a high confirmation of the phase descriptions. Only one expert did not recognise one phase. The experts reviewed all of the 89 elements and scored in which phase elements were 'relevant' (in one or multiple phases) and were 'mostly relevant' (in one of the four phases). Based on these expert scores, lists of the elements that are most related to each phase were constructed (Refs blinded).

Questionnaire survey on integrated care services

For this study we compiled a three-part Excel-based questionnaire (A-C). Part A focussed on general information about the integrated care service. Data were collected on the starting year, the number of patients covered in the previous calendar year, the number and type of health care providers involved, current agreements between care providers, the infrastructure for improvement, the availability of a coordinator at care chain level and commitment at strategic level. In part B the respondents rated the 89 elements of the DMIC in terms of relevance and existence in daily practice and where applicable since which year. In part C the descriptions of the four development phases were presented and the respondents each assessed their own development phases. Further questions concerned the completion of previous development phases, the duration of phases and the crucial factors for moving onto the next phase.

Integrated care settings

Coordinators of integrated stroke, AMI and dementia services were invited to complete the questionnaire. The rationale for our research in these groups was based on the aim of variety in patient groups covering a range from acute to chronic care. The service varied in terms of the providers involved, sectors and years of development, so that different integrated care settings in different stages of development were included. A criterion was the availability of an integrated care coordinator at a tactical level, also sometimes called an integrated care director, project or programme leader. The coordinator had to have a good overview of the current state, history and future plans of the total integrated care service. Another criterion was the availability of a national collaborative network with a good geographical spread. The National Stroke Service Network, the National Network on Dementia and the National Society for Trauma Centers are such networks and they all wrote to their members recommending participation. All 36 stroke services, 50 dementia care services and 12 myocardial services in the Netherlands were invited to participate.

Respondents

The coordinator at a tactical level was contacted by phone or e-mail. When services accepted our invitation, the Excel-based questionnaire and an instruction sheet were e-mailed to the respondent. Due to the smaller numbers, the participating AMI services were visited by one of the researchers to introduce them to the questionnaire. Non-responders were reminded twice by telephone or by e-mail. If available, the reasons for non-response and remarks on the questionnaire were documented. Each service represented by the integrated care coordinator had to complete one questionnaire. Respondents were allowed to contact other partners in their integrated care setting to provide input for the questionnaire.

Analyses

Descriptive statistics were used to analyse the first part of the questionnaire (case characteristics). To analyse the first study question we analysed the self-assessment scores for each integrated care service. We also calculated phase scores for each service, based on the number of relevant and implemented elements and the overlap with the top-ten elements per phase made by the experts [11]. The top-ten elements can be considered as a set of elements that is the most related to and representative for that phase. We considered multiple methods to identify the phase of integrated care development. These were: (a) to regard a phase as completed if 6, 7, 8, 9 or 10 out of 10 elements in the corresponding phase had been implemented; and (b) to divide the total number of implemented elements out of a possible 40 by ten, and rounding to the nearest integer. The number thus obtained corresponded with the current phase of development. For all these methods, we used Kappa tests to study the correlation between self-assessed and calculated phases. To analyse the second research question we further used descriptive statistics, Pearson's correlation, ANOVA and Kruskal-Wallis tests. To analyse the final research question, we compared the answers of the respondents with the set of 89 elements and used descriptive statistics. Data were analysed by using SPSS software version 16.0.

Results

Response and characteristics

The overall response rate to the questionnaire was 83%; 32 out of the 36 stroke services (89%), 9 out of the 12 AMI services (75%) and 43 out of the 50 dementia services (86%) participated. Reasons for non-response were lack of time or absence because of illness or holidays. The main characteristics of the integrated care services that participated are presented in table 2. The table shows a variation between the three groups in, for instance, the average start year, the number of clients and the care providers involved. For dementia no central databases with total client numbers were available. The percentage with an integrated care coordinator ranged between 33% (AMI) and 96% (dementia). The designated time available to each coordinator ranged from two to 15 hours on average per week, with a median of 8.5 hours. We analyse whether the available coordination time was related to the overlap in self-assessed phase scores and calculated phases. For this purpose, we divided the group coordinators into two, based on whether the number of dedicated coordination hours was more or less than the median. The Kappa scores of the group of coordinators with more coordination time (≥ 8.5 hours/week) were slightly higher for four out of the seven calculation methods compared to the group with limited time (≤ 8 hours/week), and could not be computed for the 9 and 10 out of ten rule. This indicates a possible higher identification with the phases as designed in the model, when coordinators have more time to spend on their integrated care coordination.

During the questionnaire research, the respondents pointed out that filling in the questionnaire was experienced as a self-evaluation exercise which gave suggestions for the further improvement of their integrated care. When sending in their data, it was notable that they asked for benchmark results.

Table 2. Characteristics of participating integrated care services

Characteristic	**Stroke n=32**	**AMI n=9**	**Dementia n=43**
Average start year (min – max)	*2001 (1996-2005)*	*2003 (1998-2004)*	*2007 (2000 - 2010)*
Average lifespan in years (sd)	*7.75 ± 2.4*	*5.67 ± .2.0*	*2.72 ± 2.1*
No. of patients in 2008 (min – max)	*449±340* *(134 – 1914)*	*1109±515* *(519 – 2200)*	*nd*
Care providers involved (% of n):			
– hospitals	*100%*	*100%*	*91%*
– expertise centre	–	–	*47%*
– mental health care	*0%*	*0%*	*98%*

Tabel 2. (Continued)

– rehabilitation centre	88%	0%	0%
– nursing and elderly homes	100%	11%	100%
– home care	100%	0%	100%
– welfare/social care	–	0%	77%
– client organisation	38%	0%	98%
– municipality	13%	0%	72%
Agreements available with: (% of n)			
– general practitioners	72%	89%	56%
– ambulances	78%	100%	0%
% with integrated care coordinator	78%	33%	96%
Average hours per week (min-max)	5.5 (0-19)	2.0 (1.5-2.4)	15 (2-36)
% with improvement teams at care chain level, consisting of	91%	78%	91%
– professionals	3%	100%	13%
– managers	3%	0%	3%
– mixed	93%	0%	85%
% with formal collaboration agreement between involved providers	69%	22%	84%
% with regular board meetings of involved providers	78%	67%	95%
% with periodically meetings with:			
– health insurers	19%	11%	28%
– care administration offices	28%	11%	93%
– care assesment organisations	25%	0%	14%

Nd= no data available

Recognition of the phases of development

All integrated care services self-assessed their development phase (figure 1). Some respondents commented that elements from later phases were also recognised in the current phase or remarked that their integrated care was about to enter the next phase. Overall, the respondents felt able to position their practice in one of the four phases and confirmed the conceptual phase-wise development as presented. For stroke, one integrated care service self-scored their practice in phase one; the most self-scored phases were in phase three (n=17) and two (n=9). The AMI services most self-assessed phase one (n=4) and four (n=3). The dementia services covered all phases, with the most self-assessment scores in phase two (n=22) and three (n=15). The service coordinators who self-assessed a phase two to four were asked if they had been through the previous phase as presented in the description. Of the respondents 92% (n=75, 4 missing) confirmed that they recognised and had experienced the previous phase.

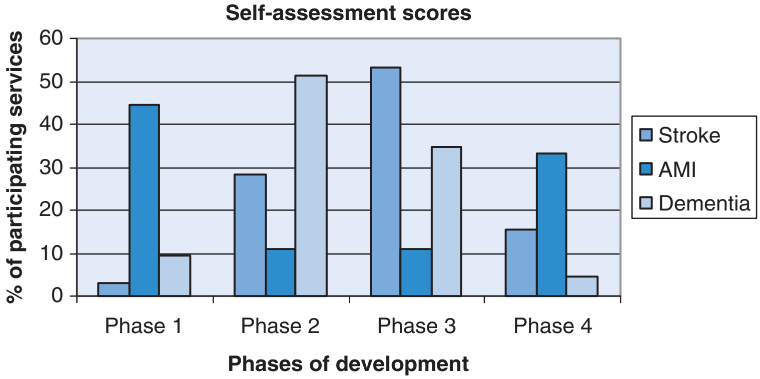

Figure 1. Self-assessed phase for three types of services

We compared the self-assessed scores of the participants with the calculation methods used to estimate the phase of development (see methods). The results are presented in table 3. For all of the methods, the Kappa scores are less than 0.20, which qualifies as poor correlation between self-assessed and calculated phases of development. For the 9 and 10 out of ten rule, no Kappa's could be calculated because no cases qualified by this method. The findings are similar when comparing self-assessed and calculated phases for each group of integrated care service separately.

Table 3. Self-assessed phase versus phase according to calculation methods

Method	Kappa	p-value	% Self-assessed corresponding with calculated	% Self-assessed higher than calculated	% Self-assessed lower than calculated
6/10	0.106	0.067	32.1	33.3	34.5
7/10	0.118	0.042	33.3	42.8	23.8
8/10	0.094	0.091	31.0	57.1	11.9
9/10	*	*	19.1	77.0	3.5
Impl/40	0.105	0.085	34.5	15.4	50.0

*could not be computed

Relationship between phases and implemented, planned elements and ages

To assess weather services in further phases of development have taken more steps towards realising integrated care, we calculated the number of implemented elements that were considered relevant. The average number for the total group was 46 ± 20 elements (range 3-82). For the three subgroups, 50 ± 18 (10-77) elements for stroke, 42 ± 13 (20-61) elements for AMI and 45 ± 22 (3-82) elements for dementia were implemented. Figure 2 shows the mean percentages of relevant implemented elements per phase, stratified by the self-assessed phase and the calculated phases according to the calculation methods. For all methods, the number of elements implemented on average increases over the phases. For the self-reported phase, correlation with number of relevant items implemented was lowest (Pearson's R 0.397). For the calculation methods, Pearson's R was up to ≥ 0.9 (for the 6/7-10 and number of implemented out of 40/10 method).

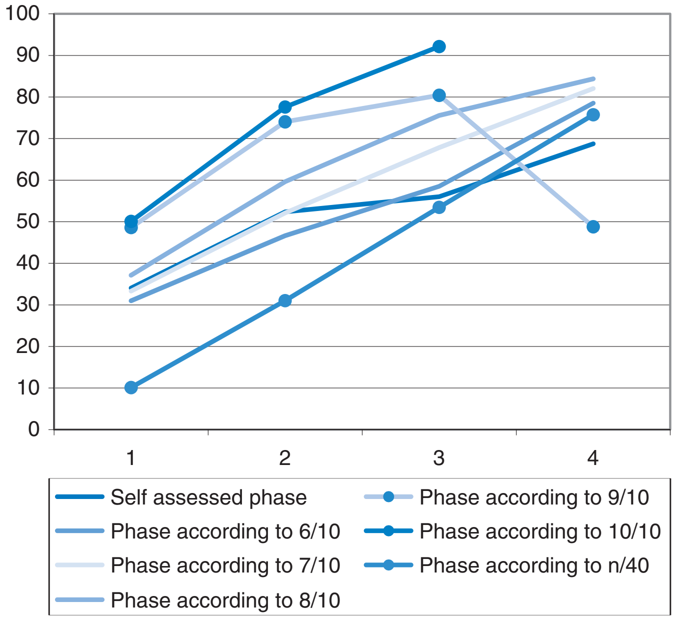

Figure 2. Percentage of implemented, relevant elements per phase

The average number of planned elements for the total group was 14 ± 14.6 (min 0, max 57). Figure 3 shows the mean percentages of relevant planned elements, stratified by the self-assessed and calculated phases according to the calculation methods. For all methods, the number of elements planned on average decreased

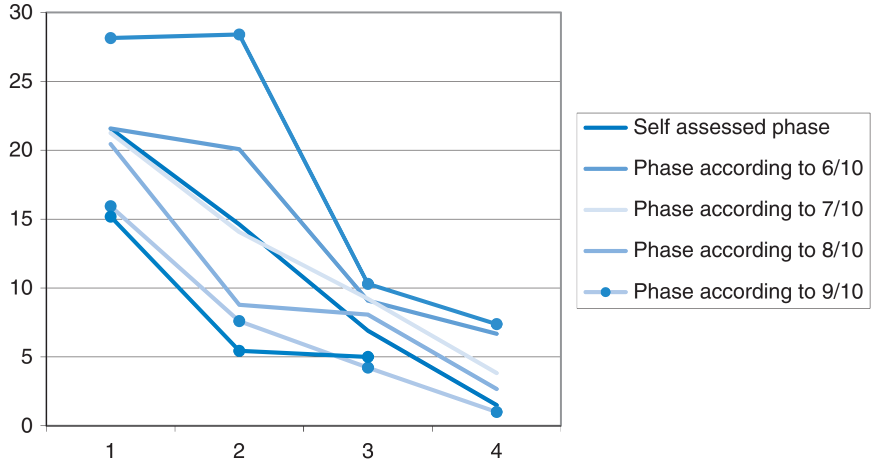

Figure 3. Percentage of planned, relevant elements per phase

over the phases. We also analysed for each calculation method the mean number of planned elements that belong to the current phase plus one. In other words, we looked for those elements of our model that mark the transition from the current to the next phase. We found that there was no relation between current phases and planned elements belonging to the next phase, indicating that although plans are being made for development of the care service, these are not necessarily aimed at the next stage of collaboration. To assess if elements of later phases were also implemented at a later moment, we analysed the age of the top-ten elements of all phases for the three groups. Table 4 shows that implemented elements for stroke and AMI in phase 1 and 2 are 'older' (e.g. implemented earlier) than elements of phase 3 and 4. This distinction is absent for dementia services, which are younger than the other two services.

Table 4. Mean age in years of elements in different phases

Type		**Mean**	**Std. Deviation**
Stroke (n=32)	Age of phase 1	6.8	2.5
	Age of phase 2	6.7	2.0
	Age of phase 3	6.1	2.1
	Age of phase 4	5.7	2.5
AMI (n=9)	Age of phase 1	5.2	2.6
	Age of phase 2	5.5	1.6
	Age of phase 3	4.6	1.7
	Age of phase 4	4.4	2.3

Tabel 4. (Continued)

Dementia (n=42)	Age of phase 1	1.9	1.8
	Age of phase 2	2.2	2.2
	Age of phase 3	2.3	2.2
	Age of phase 4	1.8	1.5

Developing to a next phase

Analyses of the qualitative data on the crucial factors for moving on to a next phase (based on self-assessed scores) showed differences and some similarities between phases (see table 5). For all phase transitions, the commitment of CEOs and the higher management levels of the participating organisations was most frequently mentioned (n=24). Also financial agreements between involved parties and financial preconditions for realising the integrated care and improvement activities were mentioned for all phase transitions (n=16). For the transition from the first to the second phase, the involvement of a coordinator, improvement teams at care chain level, the commitment to a common goal and formal collaboration agreements describing the ambitions and goals were named (all 3 times). To transform to the third phase of development, room for experiments (n=5), installing a coordinator (n=5) and adjustments between care professionals by direct contact were mentioned elements (n=5). Fewer elements were mentioned concerning the transition to the fourth phase. Only CEO and higher management commitment and financial agreements between care partners were mentioned by multiple services (n=5). Factors that were mentioned which were not included as an element in the 89 elements of the model were participation in a national improvement partnership (n=5), sustainability activities after a project phase (n=3), external pressure (by the ministry or healthcare insurers) and equity in the relationship between care providers (both n=2).

Table 5. Crucial elements for phase transitions

Element	**N=30 1→ 2**	**N=30 2→ 3**	**N=8 3→4**
Assuring the leadership commitment of the partners involved in the care chain	++	++	+
Allocating Financial budgets for the implementation and maintenance of integrated care	++	++	+
Installing a coordinator working at chain-care level	+	++	
Reaching agreements among care partners on tasks, responsibilities and authorizations	+	++	

Tabel 5. (Continued)

Developing a multi-disciplinary care-pathway	+	+	
Offering case management for clients with complex needs	+	+	
Defining the ambitions and aims of the collaboration in the care chain	+	++	
Installing improvement teams at care chain level	+		
Guiding the care chain by emphasising a collaborative commitment	+		
Achieving adjustments among care partners by means of direct contact		++	
Creating an open environment that encourages experiments and pilot projects		++	
Using a systematic procedure for the evaluation of agreements, approaches and results		+	
Stimulating a learning culture and continuous improvement in the care chain		+	

+: Element is named ≥ 3 times
++: Element is named ≥5 times

Discussion

Main conclusions

The results of this study show that the four phases of the Development Model of Integrated Care are recognized by coordinators and confirmed empirically in the participating integrated care services.

Firstly, respondents supported the presented phases and all four phases were chosen by integrated care services for the three patient groups. No phases or important phase characteristics were missed. Secondly, almost all the respondents stated that they had been through the previous phase, illustrating a certain change in development over time. A third result which underpins our conclusion is that elements that were related to earlier phases of development were also implemented earlier in time for stroke and AMI practices. This absence in the case of dementia services could be explained by the fact that they are substantially more recent and started only in 2007, with greater external pressure and time urgency.

As assumed, we found a relationship between the numbers of implemented and planned elements and the phase of development. In earlier development phases integrated care services had more plans for the future and this number of plans decreases over time. Corresponding with that, services that are in further development phases (in either way of assessment) do have more implemented elements of integrated care. These findings in integrated care services support the empirical validation of the DMIC which was based on the literature and experts in the field of integrated care. Although the phases of the DMIC were confirmed, the developmental process of integrated care services seems not to be linear and predictable. Some respondents mentioned that they were 'in between' phases, recognised aspects of two (following) phases or mentioned a fall-back. Phases can overlap or run into each other or there can be a relapse to earlier phases. There are no obvious or strict boundaries between phases. This makes it clear that the phases need to be seen as conceptual presentations, but can be helpful for evaluating and guiding integrated care development.

Phase assessment

Although representatives of stroke, AMI and dementia services felt able to position their practice in one of the phases, the comparisons with the calculated phases based on the model are interesting. The self-assessed scores overlap for about one third with the calculated phases, which are based on the present elements as indicated by the coordinators themselves. The 7-out-of ten rule seems to fit the best with the self-assessed scores (highest kappa, significant p-value). When the calculations methods are more inflexible (eight out of ten or higher), the number of services that seem to overestimate their development rises, indicating that these rules may be too strict. The self-assessment scores in our study are merely based on the integrated care coordinator, whose ability to assess therefore is an important factor. Coordinators may vary in their ability to assess and their judgement is possibly influenced by multiple factors. Our analyses show that increasing the available time has a positive effect on the overlap between the coordinators' and model's phase assessment, which may be a manifestation of a more complete role. Multiple studies from the fields of psychology and auditing show that people's judgement about current situations are influenced by earlier experiences, perceptions about the history and the future, recent failures or successes and their situation compared to others [22,23]. It is possible that these factors also play a role in this study. Using the DMIC could help coordinators to more objectively reflect on the development of their integrated care service.

Development of integrated stroke, AMI and dementia care

Although the characteristics of the three groups of integrated care services differ on multiple aspects, the development phases appeal to all of them. The stroke services can be seen as the 'oldest' of the three groups and are also the most developed in terms of number of implemented elements. About two thirds of them are in the third or fourth phase of development. The dementia services' development is comparable with the AMI services, although the latter have existed for longer. It is remarkable that the dementia services have already experienced such a fast development and implemented such a large number of elements. The recent attention to dementia at client, professional and policy level in the Netherlands, initiatives like the National Dementia Improvement Programme and the development of a method for purchasing integrated dementia care, may have contributed to this. Financial preconditions like integrated budgets are not available for stroke and AMI services. The analyses of phase transitions show that next to CEO and higher management commitment, this condition is seen as the most important factor for proceeding to the next phase. The availability of a coordinator, a multidisciplinary care pathway, case management and clear agreements about roles, tasks, goals and ambitions are, regardless of setting, crucial elements that can speed up or hinder development.

Study limitations

Our study has some limitations. Although the response rates were high, the number of participants per patient group differed. AMI services were only represented by nine out of the twelve, but this is because the number of hospitals with interventional capacities and therefore the number of services is limited. For stroke and dementia, diagnoses and treatment can be initiated in almost every hospital. Further, the knowledge of the integrated care coordinator representing the integrated care service was important for the quality of the data. To optimise this, a number of respondents also consulted their partners in the care services before completing the questionnaire. To ensure that the right respondents took part, we explained the criteria for participation in personal contact with the respondents or even visited them. Nevertheless, it would be interesting to invite multiple respondents from each integrated care service to add additional perspectives.

Research and practical implications

We have three suggestions for further research. Firstly, expanding this research to other countries with other (policy) contexts is to be encouraged. We think this is interesting because reducing fragmentation in care and improving integrated care is a major issue in many countries. Secondly, we suggest further research on the process of integrated care development. Our study gives insight into the phases of development that can be present in practice. It is interesting to monitor and follow the development in each phase. Possible research topics include the implementation strategies taken and which partners or other circumstances are involved at what time.

Thirdly, we suggest further research into the relationship between the development phases and the delivered results. It would be interesting to see if integrated care services in further phases of development do have better outcomes on processes, patient satisfaction, quality of life or disease-specific indicators.

Our study also has a number of practical implications. For integrated care practitioners, coordinators and managers the DMIC with its development phases can be used as a quality management tool for multiple patient groups. It can work as an assessment and evaluation tool to reflect on integrated care practice and may initiate discussions on how to improve and progress to further phases. The model can provide support for steering on quality and with guiding policy and improvement plans. Two other possibilities are to further develop the model into an audit tool and to facilitate benchmarking for learning from comparable others.

Conclusions

Our study shows that the Development Model for Integrated Care provides a solid basis for the development of practice of integrated care. Although the 84 participating integrated care services differed on multiple aspects and patient groups, the four development phases of the DMIC are recognised and confirmed in practice. Objectively self-assessing development phases would appear to be complex. The model can provide support in assessing development phases and giving suggestions for further development. The study suggests that the development of integrated care is a long-term non-linear process, with multiple phases in which different elements of integrated care are relevant. Integrated care coordinators find the DMIC helpful for evaluating their integrated care services and guiding further development. The four-phase model has the potential to serve as a generic quality management tool for integrated care and as a framework for further research on integrated care services and their development.

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Chapter 9

General Discussion

General Discussion

Introduction

Integrated care is seen as a useful concept for improving the quality of care and lives of many patients and reducing fragmentation and inefficiency in health care [1,2]. Integrated care is a polymorphous concept with a number of underlying concepts, aims, possible interventions, influencing factors and variations in practice [3,4]. The implementation of integrated care is therefore seen as a complex and long-term process. Until now, there is no generic set of elements or a generic quality management model for integrated care to facilitates these improvement- and development processes.

In this thesis we provide insight into the relevant activities or 'elements' for the improvement and development of integrated care. We also focus on quality management tools concerning integrated care, that can support these processes. We have performed multiple case studies in integrated stroke and dementia services. We have assessed and analysed frequently implemented elements of integrated care, the improvement achieved and the influencing factors regarding the improvement process. We have conducted a systematic literature review to assess the empirical evidence for improved performance by using two quality management models, the European Foundation Quality Management Excellence Model (EFQM)/Malcolm Baldrige Quality Award (MBQA) criteria and the Chronic Care Model (CCM), and discussed their relevance for integrated care practice. A Delphi and Concept Mapping study was conducted to identify and cluster essential elements of integrated care as a basis for a generic quality management model. An expert panel and survey study identified the development process of integrated care. The results came together in a generic model for integrated care, called the Development Model for Integrated Care. Finally, we empirically validated our model in practice by evaluating and testing the model in 84 integrated care services for stroke, dementia and acute myocardial infarction.

In this final chapter we present and discuss the main findings from our studies, starting with four key messages. Subsequently, the most relevant methodological considerations are reviewed. The general discussion concludes with recommendations for research, practice and policy.

Key findings

Implementation and improvement of integrated care

Though widely acknowledged and pursued, the implementation of integrated care has proven to be a difficult task. It concerns multiple interventions at multiple levels. The implementation process asks for substantial coordination, focus, time and support. Although integrated care services have specific characteristics, there is an overlap in their motives, aims and implemented interventions. Involved professionals can be enthusiastic about results such as satisfied patients, improved collaboration and an increased awareness of being part of a chain of care, but greater focus on measuring results is needed. Case management is a promising intervention for complex and multi-morbid patient groups to increase integrated care at client level, but must be embedded in the integrated care provider network. Quality management models in health care are not frequently used in integrated care improvement projects, but could be incorporated in national collaborative improvement programmes to support a tailored implementation of integrated care.

Available evidence for frequently used quality management models

To facilitate and focus the improvement of integrated care, a quality management model can be helpful. The EFQM Excellence model/MBQA criteria and the Chronic Care Model (CCM) appear to be the only internationally and frequently used models with healthcare specific versions and with assumed or proven relations between the model components and better results in health care. Our study shows that the evidence for improved performance by using the EFQM Excellence model/MBQA criteria is rather weak and that the number of studies is limited. For the CCM the evidence has grown in the last decade and is more substantial, but merely addresses (multiple) components of the model than the model as a whole. Both models do not have integrated care in general as a dominant focus. The CCM focuses on chronic care. An evidence-based generic quality management model for integrated care is lacking. Also, a generic set of elements that is crucial for integrated care is not available.

A generic quality management model for integrated care

We have constructed the Development Model for Integrated Care (DMIC), based on 89 identified elements of integrated care. The elements are described in terms of activities that focus on the realization, improvement, innovation or sustainability of integrated care. The elements are grouped in nine related clusters which are called ‘Patient-centeredness’, ‘Delivery system’, ‘Performance management’, ‘Quality care’, ‘Results focused learning’, ‘Interprofessional teamwork’, ‘Roles and tasks’, ‘Commitment’ and ‘Transparent entrepreneurship’. The model is assumed to be generic: it should fit multiple and diverse integrated care services ranging from acute to chronic care. The model has a resemblance with components of existing quality management models, but has a larger focus on effective collaboration, commitment, learning, roles and tasks and entrepreneurship.

The empirical validation of the DMIC in 84 integrated stroke, dementia and myocardial infarct practices confirmed our model: the elements of the DMIC are widely recognized in practice, the cluster relevance scores are all very high. Despite differences in client groups, size, focus, and providers ranging from acute to long-term social and mental health care, our study confirms that there are common and generic components which are important for the improvement and development of integrated care services. Even where integrated care services have existed for a similar length of time and there are similar national contextual factors like legislation and funding, our study shows that services vary considerably in terms of the number of implemented and planned elements.

The dynamics and developmental process of integrated care

The development of integrated care is a long-term, nonlinear process with characteristics and accents that change over time. Our research showed that integrated care development is a developmental process with four phases. The phases are: 'the initiative and design phase', 'the experimental and execution phase', the 'expansion and monitoring phase' and the 'consolidation and transformation phase'. According to our expert panel, each phase contains key characteristics and elements that are especially important in that phase. The phases are meant to describe and characterise the development of integrated care practices, not to prescribe their development.

The four phases that are part of the DMIC are empirically confirmed in the 84 stroke, dementia and acute myocardial infarct integrated care practices. All four DMIC phases are recognized and experienced in practice. Integrated care services in earlier phases of development do have fewer implemented and more planned elements, and vice versa. Elements corresponding to the earlier phases of the model are on average older in the AMI and stroke services. The self-assessment of the current development phase by the integrated care coordinators appears to be complex and is probably influenced by multiple factors like the role of and amount of support by the coordinator. About one third of the self-assessed scores overlapped with the development phase as calculated by the DMIC. There is a relation between the phase of development of integrated care services and their implemented elements. Elements with higher relevant scores are not more numerous or implemented earlier in practice. Implementation processes of integrated care appear to have different time spans; the dementia services implemented a large number of elements in a relatively short period. Incentivising factors like an urgent need to improve, national improvement programmes, an active and widespread client federation network and integrated financial structures may have contributed to this. For development through all phases, higher management commitment and financial preconditions such as integrated budgets are seen as important. Factors like installing a coordinator, agreements about tasks and responsibilities, multi-disciplinary care pathways, case management and defined ambitions and aims are seen as important for development up to the third phase.

Discussion of the Main Findings

In this section we will discuss the improvement of integrated care, the dynamics of integrated care, the general applicability of the DMIC and the relationship between the improvement of integrated care and its results.

Integrated Care Improvement

Our study showed that a large number of essential elements of integrated care can be identified and defined. Although we used strict cut-off points in both the Delphi and validation studies, 89 elements of integrated care remained as important and relevant for integrated care services. Only four elements in the AMI cases had lower relevance scores. This indicates that overall the set of elements of our Development Model for Integrated Care is relevant for the implementation and improvement of integrated care. To order all the elements that are described in terms of activities, the Concept mapping procedure resulted in the nine clusters of the DMIC. It is interesting to compare our model to other health care specific, internationally well-known and frequently used quality management models like the EFQM Excellence model/MBQA criteria and the Chronic Care Model [5-8]. Our model exhibits interesting similarities with these models, although they are developed in different contexts by using different methods. In our view, the 'Processes' and 'Personnel' clusters of the EFQM model/MBQA criteria and the 'Delivery system design' and 'Clinical information systems' clusters of the CCM overlap with our 'Delivery system', 'Interprofessional teamwork' and 'Roles and tasks' clusters. In addition all three models pay attention to results, whereas the EFQM model/MBQA criteria define four result areas and the CCM ('improved outcomes') and our model ('performance management') define one cluster with several outcome categories. Somewhat different is our cluster 'Result-focused learning'. Whereas 'Learning and innovation' is included in the EFQM, it is not a separate cluster. The CCM does not name learning but 'Productive interactions' between a 'Prepared proactive care team' and 'Informed and activated patients'. The stronger focus on development and learning in our model could reflect the continuous development of many integrated care programmes nowadays [9, 10]. Another difference concerns 'Transparent entrepreneurship', a cluster of elements about the balance between competition and cooperation in health care and the need for entrepreneurship and innovation. This is not explicitly included in either the EFQM model/MBQA criteria or the CCM; the Expanded CCM does however touch upon this issue [11]. Further differences are seen in a stronger focus on effective collaboration (commitment, roles and tasks) and conditions for integrated care in our model.

Another difference is the attention to (phases of) development in our model. The Dutch equivalent of the EFQM Excellence model defined five phases and appeared to delineate a more stepwise and rational model. Recently they relaxed their approach; organisations do not have to comply with all the criteria for each phase to reach higher levels [12, 13]. The Chronic Care Model defines four stages of development, but the stages themselves are not described [14]. A difference is that the elements within the CCM differ in intensity or presentation per phase, but are assumed to be relevant in all phases. In our model, a number of elements are merely phase-specific. Each upcoming phase is not only a step further in development, but can also have new and phase-specific characteristics. Critics of life-cycle models suggest that the evidence for life-cycle models is based on merely conceptual and descriptive literature. Also most of the time there is no consensus over the number, definition and characteristics of phases [15]. In our study the (also conceptual) phase descriptions have been validated and confirmed in practice with regard to the number and characteristics of phases.

Our case studies in stroke and dementia care show that the implementation of integrated care is experienced as a difficult task. There is a large number of possible activities, stakeholders and influencing factors. The stroke services which participated in the Breakthrough programme illustrated in another way the need for guidance in the complexity of the improvement process. The first group of stroke services was free to select improvement activities, but the second group could no longer choose all of their improvement topics, as these were predefined by the national project group. Surprisingly, there was no resistance at all. Stroke services favoured this guidance because it reduced the complexity of the improvement process. This need for steering and guidance links to the validation studies of the DMIC. These studies show that integrated care services undertake numerous actions, but these are not evenly divided over the clusters of the DMIC; nor are they related to priority or relevance scores. The DMIC could guide a more focused and balanced improvement. Apparently, there are other factors that define the elements that are being worked on. The phase of development could play a role; elements that were related to earlier phases in the model turned out to be implemented earlier in practice. This illustrates a certain implicit logic of implementing elements which suit a development phase, although integrated care coordinators do not use phase-wise thinking in practice. However, as assumed, integrated care services that were in later development phases had a greater number of implemented elements and fewer plans compared to more recently started services. The average number of planned elements per service was high, which raises questions about the attainability of these plans and the need for focus especially when we take into account the complexity of improving integrated care.

Overall, the use of a model like the DMIC might be supportive in a more focused improvement of integrated care. At present quality management models however do not play an important role in integrated care improvement. National improvement programmes like the National Dementia Programme and the Stroke service collaborative were named as supporting implementation strategies, although for stroke this programme was already in use more than five years ago. These implementation programmes contain a mix of the latest professional guidelines or care pathways, combined with change management interventions like a Breakthrough methodology and guidance for the participants. In the Netherlands, these implementation programmes do not take into account different phases of development of the participating (integrated care) teams. The programme is equal for all participants. Baseline measures, the available knowledge, preferences and good practices determine the elements being worked on [16-20]. It could be worthwhile to develop and study implementation programmes which do take into account the development phases of participating (integrated) care services. By for instance including an (e.g. self) evaluation based on the DMIC at the start of the programme, more tailored interventions and strategies can be used.

A Generic Quality Management model for integrated care

One of the results of our study is the Development Model for Integrated Care, a quality management model which defines essential elements for integrated care services. Our aim was to develop a model with a generic character. To validate this model and to assess its generic character, 84 integrated care coordinators reviewed the model in the light of their own setting in the Netherlands. The results of this validation process indicate that the model is recognized and relevant, regardless of different client groups, the size or age of the integrated care services or other local or regional characteristics. It is interesting to discuss the generic character of the model further.

On the one hand, our model reveals that integrated care is a generic concept. On the level of the integrated care service, or the 'meso' level of integrated care on which our study focuses, components like client-centeredness, commitment, a well-organised delivery system, transparent entrepreneurship and other components as reflected in the nine clusters of the DMIC are relevant for multiple client groups and types of integrated care services. This is interesting because a wide variance was seen in the practices and the idea of the 'uniqueness' of the particular setting is often heard. The 'breadth' of integration or the amount of vertical integration defined as the collaboration between different types of organisations [1] differs from one case or client group to another. The AMI services focused more on acute care worked with other involved professionals and less involved organisations than for instance the dementia services, which often also include mental health care and social care. This reveals that despite these variances between groups, essential components of integrated care at the level of the collaborative network seem to be less specific than sometimes assumed.

On the other hand, the appearance of each element will probably show (some) differences in practice. Inevitable, this diversity could also have played a role in the study when the integrated care coordinators interpreted the elements in the questionnaires. In practice the elements could have 'specific fits' with local characteristics or the client group. Studies on the evidence of other quality management models also point out variance in practice [21, 22]. Working on the Chronic Care Model's component 'self management' can for example consist of very different interventions which are often not described in detail [21]. For conceptual studies like ours this is no barrier, but for research into the results of implemented DMIC or CCM components it is important for this diversity in practice to be taken into account.

An interesting question for discussion is whether the DMIC is potentially useful for any type of client in any type of integrated services. Current studies suggest that multi-problem, or highly complex, patients are not served sufficiently by the more group-wise or disease-specific approach of most integrated care services or disease management programmes [23]. The Kaiser Triangle of the Pyramid of Care [21, 22] makes a distinction between three levels of patient groups and their care needs. These are 'primary care with support' for the majority of non-complex situations, 'care management' for high-risk or unstable patients and 'case management' for highly complex patients. Our DMIC appears to concentrate on Kaiser's second level, as our validation studies show that the DMIC does fit multiple (high-risk) client groups (AMI, stroke, dementia) who need integrated care, often including care pathways or disease management programmes. Other such groups could for example be client groups like diabetes, COPD, palliative care, heart failure or CVRM clients. We recently started two initial case studies in Dutch diabetes care and in a palliative care network, which both revealed high relevance scores for the model [24, 25]. This leaves the question as to whether our model could also be useful at Kaiser's third level, for highly complex patients with multiple morbidities. Our validation study in dementia services might be seen as a successful first test, but there is as yet no evidence that our model could also be valid for other multi-morbid or highly complex patient groups like frail elderly persons. On the one hand, most clients in the dementia services also have other health and psychosocial problems apart from dementia. The case management study on dementia reflected the range of multiple needs and the wish for an integrated approach that both the client and the provider network level. On the other hand, our focus in validating the DCIM was on the dementia service, so conclusions about any multi-morbidities that were present could not be drawn.

Maybe the guidance and implementation of integrated care services for these groups ask for more specific models. For the increasing numbers of multi-morbid and frail patients, case management or 'guided care' approaches are being implemented nowadays in a number of countries. In the US, guided care interventions are mainly being implemented in primary care settings for people with multi morbidities [26,27]. In the Netherlands and Europe case management for dementia patients has increased and is mostly delivered by a nursing home or home care organisation [28]. In these concepts a central intervention is often a generic assessment of client needs and a qualified nurse who coordinates and also delivers care in an individual and client-focused way. In our model, 'Offering case management for patients with complex needs' and 'Designing care for clients with multi- or co-morbidities' are just two of the 89 elements in the 'client centeredness' and 'delivery system' clusters. Organising care for complex and multi-morbid patients should not be seen as isolated interventions, but should be embedded in an integrated and holistic redesign of the care delivery system on multiple levels [29]. Our study on case management in dementia care services revealed that according to the case managers, investment in a strong provider network was the most important success factor. Others like Kodner [1] confirm this and stress that case management should be seen as a care coordination approach and one of the essential components of integrated care, but that it is often confused with integrated care.

A further point of discussion is the possible international applicability of our model. The model has been validated only in Dutch integrated care settings. As described in the general introduction, integrated care is a polymorphous concept with a number of definitions, varieties, types and underlying concepts which can vary between and within countries. Conclusions about the international applicability cannot therefore be drawn just like that. The national context and characteristics at macro system level like legislation, financing and also professional education will have their influence on the standard of the local integrated care service and therefore on our study results. When comparing system elements, there is a risk of getting lost in translation and assessing which differences contribute to or hinder integrated care [30]. On the other hand, the motives and aims for integrated care to improve patient care and to reduce fragmentation are comparable in a large number of countries with different health care systems [31]. Our model is based on international literature and a Dutch expert panel with also some international experience. However, other quality management models like the EFQM Excellence model/MBQA criteria and the CCM are used internationally despite their different backgrounds, origins and content. The EFQM Excellence model/MBQA criteria have been developed and are used in a large number of European and American countries. The CCM has been developed and tested mainly in the USA, but has also been successfully introduced in other parts of the world like Canada and Europe. Because of the international importance of organising effective integrated care and the overlap in aims and interventions worldwide, expanding our knowledge and the DMIC internationally and further testing its generic character is an interesting next step. A first step is now being taken in a Canadian study which uses the DMIC in integrated care practices.

The dynamics of Integrated Care

Our study showed that the development of integrated care can be seen as a multi-phased and long-term process with different accents over time. The four development phases were validated in practice. We found integrated care services in all four development phases, assessed by the integrated care coordinators or as calculated by the DMIC model. Our finding that elements that are important in an earlier phase were also implemented earlier in time, confirms the model. Our four phase model shows resemblance with some of the literature about organisational development that describes life-cycle models. The review by Phelps of 33 life-cycle models for organisations, found three to five phases in about 70% of the models [15]. Quinn and Cameron [32] composed a four phase model based on their analyses of nine life-cycle models and, as in our study, concluded that common phases of development can be identified.

Assessing the phase of development appears complex. The respondents sometimes stated being 'in between' phases, or recognised aspects of two (following) phases in their situation, or mentioned a fall-back. There are no obvious or strict boundaries between phases and stagnation or relapses can occur. The current development phase, as self-assessed by the integrated care coordinators, overlapped for about one third with the 'calculated' phases based on the DMIC in our study. These calculated or expected development phases of each integrated care service were based on the implemented phase-specific elements. The self-assessment scores are merely based on the judgement of the integrated care coordinator, whose ability to assess is therefore an important but insecure factor. Involving more stakeholders per integrated care service would be interesting so as to achieve consensus from different perspectives. The respondents were very interested in feedback from our study about their calculated development phase. This information inspired and guided them in taking further steps that fitted in well with their development process over time.

When looking at the characteristics of the phases, the intensity of collaboration and the nature of the activities show different emphases in each phase. The levels of integration as defined by Leutz [33,34] – linking, coordinating and full integration – are mirrored in the descriptions. In the 'initiative and design' phase, the linking of providers, through cooperation, the sharing of information and definition of responsibilities for each service without shifting costs and responsibilities are present. In our second and third phases the integrated care operates largely through the separate structures of the current systems, corresponding with Leutz's 'coordination' level. Leutz's third level of 'full integration' is mirrored in our fourth phase description, where new programmes or resources from multiple systems are pooled and structures transform. Overall, our study makes clear that the phases need to be seen as conceptual presentations of the development process of integrated care services; the phases are not meant to prescribe.

We found that integrated care services with comparable ages or starting years can be at different phases of development. This is in a context where the national factors are the same, which makes clear that integrated care services themselves can influence their development. At group level, it was remarkable that overall the younger dementia services had experienced fast development and had implemented a large number of elements relative to the age of the stroke and the AMI services. It is interesting to discuss which factors are important in speeding up development. For dementia, the recent national attention to dementia, initiatives like National Dementia Improvement Programmes and the development of a method for purchasing integrated dementia care may have contributed to this. According to all the respondents the factors influencing successful implementation were different for each phase of transition, but overall two aspects were most frequently named: CEO and higher management commitment and financial preconditions such as integrated budgets.

This underlines the connection of the integrated care service at the 'meso' level of integrated care to more 'macro' or system factors, which provide the context for integrated care services. Our study did not focus on the macro level, but the validation studies show that the relationship with this level explains an important part of the dynamics of integrated care. The involvement of CEOs and higher management as important stimulating factor have also been found in other studies about integrated care, implementation and change management [35-37]. However, what roles and approaches of these stakeholders are effective in each phase of development is less clear and requires more research. In the Netherlands, the implementation of integrated budgets for integrated care is just being developed and experimented with, with no rigorous evaluations as yet of the effects. Internationally, the search for health care systems that facilitate integration and efficiency remains ongoing. Best practices like Kaiser Permanente in California for example outperform the National Health Service in the UK or the Danish Health system. However, the spread and translation of best practices are not easy and are complex [29,38]. A recent OECD study in 29 countries also pointed out that 'system solutions' are not the (only) final solutions. No type of health care system performed systematically better than any other in improving the population's health status in a cost-effective manner [39]. Because of the complexity, long time-spans and non-controllable macro interventions, integrated care coordinators, professionals and managers should focus on their own strengths and work on balanced implementation and development in their own setting. However, more knowledge about contextual factors and their effects on integrated care is needed.

Our model focuses on merely organisational aspects and activities in integrated care services, but 'human' aspects like social relations, cultures, interests and power are also components of the dynamics of integrated care [10, 40]. In our study the DMIC points to these aspects in the clusters 'commitment', 'interprofessional teamwork', 'roles and tasks' and 'transparent entrepreneurship'. Elements like 'establishing dependencies', 'letting go domains' and 'stimulating trust' are examples. Also the case studies in stroke and dementia stressed the importance of effective collaboration and multidisciplinary teamwork in integrated care. However, the importance of collaboration in integrated care is widely acknowledged, and is no easy matter [41, 42]. A deeper insight into these aspects within each development phase would be worthwhile.

To summarise, our study revealed important knowledge about the development of integrated care over time. Extending our findings to contextual factors and greater attention to 'human' aspects are necessary to broaden the knowledge concerning the dynamics of integrated care.

Results of Integrated Care

Studies on integrated care, including this thesis, eventually aim to provide knowledge for or directly to improve the outcomes of integrated care for clients. The aims to be achieved in integrated care are balanced with regard to multiple performance dimensions (quality of care, quality of life, efficiency, satisfaction, etc) and can also differ according to the stakeholder involved [31]. Our studies, like the stroke and dementia case studies, provided some information that measuring the results of integrated care is important, but not yet routinely done in Dutch practice. In the first stroke study results were measured by a general scale in addition to outcome indicators. The stroke services showed that they were not yet being capable of measuring results, while recording systems for indicators were lacking. During the study these services started measuring outcomes by using prestructured Excel sheets, but the total group was unable to deliver solid data within the study time-frame. For the case management programmes in the dementia services, information on the results was collected but was available to any limited extent in practice. In the validation studies we obtained the permission of all the respondents to use their available national benchmark data in relation to indicator sets for the AMI and stroke services, but the databases did not provide enough data (for AMI services) or uniformly measured data (for stroke) to be used for analysis. For the dementia services, the measurement of results was just being introduced with no consensus as yet about the indicators. This lack of consensus resulted in poor response rates in comparison with the national benchmark. Evaluation studies and research on the results of integrated care often also report the difficulty of drawing solid conclusions due to the lack of solid outcome data, the complexity of the research designs and the multiple and simultaneously present influencing factors [43,44]. However, assessing the results of all the efforts made in integrated care and their impact on healthcare costs is crucial and needs more detailed study.

The DMIC does pay attention to the results of integrated care. Within the model, results are stressed, especially in the 'result focused learning' and 'performance management' clusters. In these clusters elements such as 'making transparent the benefits of the collaboration for each care-chain partner', 'defining performance indicators to evaluate the results of integrated care' and 'gathering data on client-related performance data, client logistics and client judgements and satisfaction' are elements. These elements could provide support for integrated care practices, but need further professionalisation and standardisation in terms of the selection, definition, operationalisation and uniform measurement of the indicators used. For a number of client groups, indicator sets have been developed or are under construction, often starting from disease-specific guidelines or care standards. Examples are HbA1C scores or percentages of foot examinations for diabetes or the thrombolysis rate for stroke patients. Sometimes the results of the integrated care are only measured by using this kind of client-related outcome data. Apart from these indicators, our model can add value by providing an overview of more 'structure or process-related' generic elements at the level of integrated care collaboration. Together they can provide a complete picture of the results and the development of integrated care services.

To conclude, generating knowledge about the organisation, results and costs of integrated care is important. The DMIC can support by providing solid information about the merely organisational aspects and the development phase. If data on results and costs are also present, further analysis on relations between those three important aspects can be conducted. Interesting questions are whether the number of elements implemented or progression to further development phases is related to better results, and if so to what extent. Because of the lack of solid outcome data and our need to focus on the essential steps to develop and validate a generic model, our study was as this stage unable to provide knowledge on this issue. Our study does, however, generate interesting input for the further analysis of these important relationships.

Methodological considerations

There are some issues that should be considered in interpreting the findings in this thesis.

Overall, there were high response rates in all of our studies. The commitment of the expert panel in multiple parts of our study was valuable. We used a mix of methods, ranging from literature studies, case studies and a Delphi and concept mapping study to multiple questionnaire researches. More than 100 integrated care coordinators or programme leaders of multiple integrated care services from all over the country were involved. However, several limitations need to be considered.

Our cases, especially in the first study on stroke, were self-selected cases that were designed to improve the integrated care. In the dementia study on case management, cases were selected that had existed for over a year, leaving other or already failed programmes out of account. Despite this, we found a lot of variation between the integrated care practices in all our studies. There were no validated instruments available for our interviews in the dementia case management programmes. To compensate for this, we developed a questionnaire based on the available international literature. The questionnaire is now being used in a Finnish case management study in dementia [45].

Furthermore, as in any (systematic) review, it may be possible that we missed relevant studies. Because of the attention to integrated care, new studies also have emerged. In our studies there were multiple opportunities for respondents to add missing elements or to make comments. The interviews ended with an open question for further suggestions; in the Delphi rounds new elements of integrated care could be addressed in each round, and in the validation studies integrated care coordinators could comment on the elements of our model or address missing elements. These opportunities were taken up, but only to a limited extent and the suggestions given were merely related to elements of integrated care that had already been included.

Although we have considered the limited involvement of clients (or their representatives) in our study multiple times, this is a limitation. In our view it was difficult for clients to have a complete overview of the organisational agreements, history or plans of the integrated care services. However, because of the importance of achieving aims such as continuity and better outcomes of care that directly affect clients, the involvement of clients/client representatives is an important issue in future studies. In our recent case study in which we use the DMIC in diabetes care [24, 46], the local client federation played a role in assessing the elements of the DMIC and prioritising improvement topics.

Our Delphi expert panel consisted of Dutch experts, of whom a number had conducted international research into or had project experience in integrated care.

Although we started the Delphi process with elements based on the international literature, the Dutch context and background of the experts will have influenced the results. Given the attention to integrated care in multiple countries, it would be interesting to expand our results internationally. Presentations on and reactions to articles (especially regarding the DMIC) by international colleagues (Canada, UK, USA) show that there is already some interest in our work, but further research is needed.

The validation of the DMIC in our last two studies was based on the self-assessed scores of the integrated care coordinators. Although they are central figures in local integrated care settings, involving more professionals and managers in each setting is to be encouraged. It is expected for example that the role, perspective, available coordination time and responsibility of the coordinators will have their impact in their assessment scores. The differences we found between the self-assessed scores and the calculated scores underline the importance for further research with more stakeholders in each of the integrated care services involved.

Lastly, we were not able to measure performance or outcomes in our studies. It had been our intention to do so, but factors such as the amount and quality of the available data and our study focus made it difficult to draw firm conclusions. Because the aim of integrated care improvement and development is to achieve better patient care on multiple performance dimensions, there is a need for greater focus on measuring results in a coherent and adequate way. Only then can crucial further analyses concerning the relationship between the efforts made and the results achieved in integrated care be made.

Recommendations for Research and Practice

Our research has delivered a number of recommendations for further research and for practice.

Research

For researchers in integrated care, our study has thrown up a number of interesting new questions that can act as an inspiration for further research. Overall, the DMIC model can be used as a conceptual and empirically validated framework for further research on integrated care. The model can be used as an evaluation framework for a diversity of studies, and for measuring the development of integrated care over time at local or national level. The nine clusters of the DMIC may also be regarded as nine important topics for the research agenda on integrated care. For each cluster, questions can be asked as to which elements are the most effective and in what variations. Our recommendations address three main topics: further assessing the generic character of the DMIC; further research on the improvement and the development phases of integrated care; and further research on the relationship between the organisation of integrated care and its results.

The generic Development Model for Integrated Care

Our study resulted in a quality management model for integrated care that has a generic character and can be used in multiple integrated care settings like dementia, AMI and stroke services. Our first suggestion is to conduct further research on the applicability of the DMIC by involving multiple key persons for each integrated care setting. Apart from integrated care coordinators like those involved in our study, the involvement of for instance professionals, higher managers and also clients and their representatives is recommended. By involving the multiple perspectives of these actors, it becomes possible to examine the present consensus among partners about present or future elements or development phases. This would serve to broaden the knowledge concerning the general character of the DMIC. Our recent case study in the field of Dutch diabetes care and in a pallian network used this approach with multiple partners in respect of consensus building. The studies revealed high relevance scores and showed the value of this method, but more research is recommended [24, 25, 46].

Further, expanding and repeating our questionnaire research to multiple and other integrated care services is recommended. These could be integrated care services for groups such as clients with diabetes, COPD, heart failure and others. Further research is needed focusing on the relevance of the DMIC elements, clusters and phases for these groups. Also, it would be interesting to research the extent to which our study results can be used for the organisation of care for client groups with multiple morbidities, such as the frail elderly and chronically ill, in order to establish the scope and the limitations of the DMIC.

Lastly, research to assess the international relevance and applicability of the DMIC is recommended. As in other national studies, the Dutch context and macro system level characteristics such as legislation, professional education and financial systems will have influenced our results. Organising a replication study in which an international expert panel reflects on the DMIC elements and the development phases could be a step further to assess the DMIC's generic character. Validation studies into comparable or other integrated care services in other countries would also add new knowledge to our study findings.

Developing integrated care

Our study revealed a large variation in the number and types of elements of integrated care that are implemented or planned in practice. Further research to provide a deeper insight into the characteristics and variants of each element in diverse practices would be desirable. This could result in a rich collection of examples of the integrated care elements. Further qualitative research into the implementation strategies of integrated care services and the incentivising and hindering factors encountered is also to be recommended. For national improvement programmes, and their funders, we recommend that implementation programmes in which the development phase of the integrated care setting is taken into account be executed and analysed. This could yield new knowledge concerning integrated care implementation and the design of national improvement programmes.

A second recommendation in this area is the need for further research on the development phases of integrated care. Although we collected some data on phase duration, further research on time-spans and effective strategies within each phase could increase our understanding of the development process. Special attention should be given to factors that could speed up or slow down development and to the needed roles and capabilities of the professionals, coordinators and managers involved in each phase. Studies with a longitudinal design that follow integrated care services in respect of these aspects over time are recommended.

Thirdly, we recommend expanding research on the dynamics of integrated care. Our study focused on development over time with its characteristics and key issues for each development phase. Other aspects of developmental dynamics at macro and micro level could add to our findings. Research topics are the influence of national and more local contextual factors, the role of power, interests, social relations, learning and language. As we know from other research into quality improvement, this type of research involves multiple challenges: the changes occur simultaneously, and there are concurrent external and internal stimuli [15, 43, 44]. Nevertheless, it would broaden our knowledge about the complex dynamics of integrated care development.

Results of integrated care

The aim of working on integrated care is to achieve better results in patient care. This involves reducing fragmentation and costs in care and improving clinical outcomes, quality of life, patient satisfaction, effectiveness (use of evidence-based guidelines) and efficiency [1-4]. The available evidence does suggest that these results could be expected, but further studies are needed. Our last research recommendation therefore calls for solid research into the results of integrated care services on multiple performance dimensions related to the development phases or present elements of the DMIC. Interesting research questions are whether better results are achieved by integrated care services in further development phases or by implementing more elements. Or: what characteristics related to the DMIC can be seen in the best performing integrated care practices?

Practice

Our research has a number of practical implications, some of which were also suggested by the respondents in our study. First, a generic quality management model for integrated care that can guide integrated care improvement and further development in practice was lacking. Our DMIC can help rectify that omission. More focused development, implementation programmes and policies could enhance the development of integrated care on multiple levels. Because there are multiple and different stakeholders involved in integrated care, our suggestions for practice are presented below by category.

Integrated care coordinators and managers

The role of a coordinator working at the level of integrated care is an important one for encouraging and improving integrated care. In our study we found that quality management models do not play a dominant role in the improvement process. Multiple activities in integrated care are being undertaken every day, but they do not always appear to be focused, balanced, or connected with the development phase of the integrated care practice. Integrated care coordinators and integrated care managers could use the Development Model for Integrated Care to guide and steer their integrated care implementation. The model could be used as a self-evaluation tool at the level of the integrated care practice. A self-evaluation based on the 89 elements could help identify the current position, present balances/imbalances in respect of the nine DMIC clusters and the current development of the integrated care practice. The model can reveal improvement areas and suggest interventions appropriate to the phase of development. It can be used for multiple client groups and provide a more objective tool for focused quality improvement and for involving managers and professionals at various levels in their combined efforts to deliver better care. The model can also be used for quality management policies and integrated care policies in collaborative networks. Lastly, linked to the suggestion for self-assessment, the DMIC could also be used as a framework for auditing integrated care services with a focus on further improvement. The National Stroke Service network of the Netherlands has decided to encourage and provide facilitation for their members to regularly assess their stroke service based on the DMIC, as a starting point for the future auditing of all stroke services.

Health care professionals

Professionals put in their energy into a large range of improvement activities in integrated care settings, but these are broad and sometimes unfocused. Professionals can use our results and the DMIC for inspiration and to reflect on their own practice and select improvement activities that fit their particular phase of development. Attention to all of the nine clusters of the DMIC is recommended. Health care professionals could use the DMIC as an assessment and consensus tool by involving multiple stakeholders in the care chain, including patient representatives. Based on individual scores on the elements, clusters and phases of the DMIC, consensus can be established or differences discussed as input for improvement plans. In the Netherlands a web-based self-evaluation tool based on the DMIC has recently been developed offering this option, which can be used for diagnostics and evaluation purposes in practice [47].

Health Care Inspectorate

In a number of countries, the Health Care Inspectorate focuses solely on the quality of professionals or the quality delivered by health care organisations. As is known, the quality of care is also largely influenced by the collaboration between professionals and organisations in delivering coherent and seamless integrated care. Assessing the quality of integrated care services to further stimulate coordination and collaboration activities is a complex area open for further exploration. Our research could contribute to that by revealing which aspects are important in integrated care. In that perspective, the model could supply a framework and give inspiration for the Inspectorate for the development of inspection methods and processes.

Policy-makers and financers

Achieving better outcomes of care and developing the right policies that stimulate better value for money in health and social care is a key issue for numerous insurers, local and other financers and policy-makers at national and more local levels. This includes developing the right policies and incentives for health care professionals, managers and CEOs. Nowadays, performance indicators are being developed and used to monitor results of integrated care in many countries. For instance, a set of indicators for integrated diabetes practices which measures aspects such as HbA1c, blood pressure and the percentage of clients who have a yearly foot examination. Our study and the DMIC model could provide input for the 'organisational' part of these performance measures, so that together a balanced picture can be made. This picture of the integrated care services can be used to pursue and stimulate the practices to reach further phases of development. For this purpose it is important to stimulate and reward progress and improvement, and to offer time for growth and development. Elements in the DMIC 'result-focused learning' cluster such as 'linking consequences to the achievement of agreed goals' and 'integrating incentives for rewarding the achievement of quality targets' point directly to this.

In our view, the DMIC can provide a solid basis for future work on the organisational aspects in the 'triangle of organisation, costs and results' of integrated care, which is regarded as key for further national research and policy agendas in integrated care.

Final Conclusion

The studies in this thesis show that the improvement and development process of integrated care is a long-term, multi-component process in which integrated care services work on a large range of activities. Quality management models are not frequently used in integrated care improvement and an evidence-based generic quality management model for integrated care is lacking. In addition, a generic set of elements that are crucial for integrated care is not available. We have provided insight into the relevant activities or 'elements' for the improvement and development of integrated care. The 89 elements identified, which have been grouped in nine clusters, show that integrated care services do have generic components. The clusters are called 'Patient-centeredness', 'Delivery system', 'Performance management', 'Quality care', 'Results focused learning', 'Interprofessional teamwork', 'Roles and tasks', 'Commitment' and 'Transparent entrepreneurship'. Multiple aspects influence the dynamics and developmental process of integrated care services over time, but overall these processes can be conceptualised as phase-wise growth. Four phases are identified: 'the initiative and design phase', 'the experimental and execution phase', the expansion and monitoring phase' and the 'consolidation and transformation phase'. The elements, clusters and four phases together form the Development Model for Integrated Care (DMIC). The model has a resemblance to components of existing quality management models, but has a wider focus on effective collaboration, commitment, learning, roles and tasks and entrepreneurship. Another difference is the attention to the development phases over time as a part of the dynamics of integrated care. The phases have changing characteristics and key elements and could therefore have implications for (e.g. supportive) improvement strategies.

The DMIC has been successfully validated in 84 integrated stroke, dementia and AMI practices despite differences in client groups, size, focus, and involved providers. There is variation in integrated care practices regarding stage of development, and the number of implemented and planned elements is related to the current development phases. Integrated care practices could be supported by a quality management model like the DMIC. The DMIC can be used to assess the current situation and guide further improvement for integrated care coordinators, professionals and managers. Policy-makers can use the DMIC to stimulate and reward further improvement in integrated care. Our recommendations for further research address the further assessment of the generic character of the DMIC (other client groups, multi-morbidities, international relevance); the improvement and dynamics of integrated care (contextual and human factors); and the relationship between the organisation of integrated care, costs and its results.

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Summary

This thesis explores the essential elements, implementation and developmental process of integrated care with a view to providing a quality management model for integrated care. Integrated care is required when a coordinated set of services is needed to cover the full range of client demands. The outcomes of this study add relevant information to our knowledge about integrated care and come together in the Development Model for Integrated Care (DMIC; in Dutch OMK: Ontwikkelingsmodel voor Ketenzorg). In addition the DMIC was empirically validated in practice.

Chapter 2 contains an implementation study of integrated stroke care. In all ageing populations, stroke is a major and growing cause of death, long-term disability and considerable health care costs. A large number of disciplines and types of organisations, like hospitals, nursing homes, rehabilitation centres, general practitioners and home care providers, are involved in the provision of appropriate stroke care. Our study describes an improvement programme for stroke care that was started because stroke services had not substantially improved despite the availability of best practices, evidence-based guidelines and quality criteria for stroke services. In the structured improvement programme twenty-three stroke services participated in two groups, representing some 140 healthcare organisations. They formed multidisciplinary teams, analysed bottlenecks, set about six to seven improvement aims, used rapid-cycle improvement and reviewed self-reported performance data. The topics most frequently worked on were length of stay and patient logistics, transfer of information between health care professionals, the improvement of after-care facilities and the implementation of thrombolysis treatment. To establish improvement, a five point Likert scale from 1 (no activity) to 5 (outstanding progress) was used. Eighty-seven per cent of the teams improved their care significantly on at least one topic. About 34% of the teams have achieved significant improvements on all their aims. The study showed that a structured improvement programme can catalyse improvements in integrated care services. The stepwise methodology, the external support, the time pressure and the focus on measured outcomes stimulates collaboration and practical action within the complex whole of integrated care services. A high number of teams reported that cooperation among care partners and awareness of being part of a care chain increased as a result of the project. To further assess the value of the improvements made in integrated stroke care, it is crucial for effects on client level like for instance client satisfaction, health status and logistics or waiting times to be studied as well.

Chapter 3 describes a multiple-case study in eight regional dementia care-provider networks. The number of dementia patients is growing, and they require a variety of services, making integrated care essential also for the ability to continue living in the community. The study describes and analyses an extensive case management approach as an ingredient of integrated dementia care in the Netherlands. Based on a literature study, a questionnaire was developed as a basis for 16 semi-structured face-to-face interviews with the responsible managers and case managers of the eight case management programmes. Project documentation for all the cases was studied. Our study showed that although the eight programmes were developed independently and in different parts of the country in order to improve the quality and continuity of long-term dementia care, there were similarities in approach. These concern the vision, the tasks of case managers, the case management process and the participating partners in the local dementia-care networks. Differences concern the targeted dementia patient groups as well as the backgrounds of the case managers and their position in the local dementia-care provider network. Factors for successful implementation are the expert knowledge of case managers, the investment in a strong provider network and coherent conditions for effective inter-organisational cooperation to deliver integrated care. Case managers favour a broad multi-task model during the whole care continuum, and experience linkages with a multidisciplinary team and physicians as an advantage. The programmes did not (as yet) assess the effects on client outcomes, service use and costs. When explored, caregiver and patient satisfaction were high. The study showed that the (case) managers are convinced about the merits of case management intervention and find it crucial for tailoring care for complex groups like people with dementia. Implementation of sustainable case management is considered as complex and time-consuming because of the many health care professionals and organisations involved with different interests and ways of financing. To facilitate implementation, a focus on joint responsibilities of the care providers involved is needed, together with incentives for collaborative contracts among financers like insurers and providers.

In **chapter 4** we review the literature on the evidence for improving performance through the use of quality management models in health care and interventions based on those models. To facilitate the implementation of integrated care, various integrated quality management models can be used. The European Foundation Quality Management Excellence model (EFQM), the Malcolm Baldrige Quality Award criteria (MBQA) and the Chronic Care Model (CCM) appear to be internationally and commonly used models with healthcare-specific versions and with assumed or proven relationships between the model components and improved results in health care. A systematic literature review from 1995 to May 2006 in the Pubmed, Cochrane, and ABI databases was conducted. After selection 37 studies were included, 16 in the Excellence award model search and 21 in the Chronic Care Model search. Data were retrieved about the main intervention elements, study design, evidence level, setting and context factors, data collection and analysis, principal results and performance dimensions. No Excellence Award model studies with controlled designs were found. For the Chronic Care Model, one systematic review, one meta-analysis and six controlled studies were included. Seventeen studies (two Excellence award model, 15 Chronic Care Model) reported one or more significant results. There is growing evidence that implementing interventions based on the evidence-based Chronic Care Model may improve process or outcome performances. The evidence for performance improvement by interventions based on the expert-based Malcolm Baldrige Quality Award criteria and the European Foundation Quality Management Excellence model is more limited. Only a few studies include balanced measures on multiple performance dimensions. In many studies health care organisations like hospitals or primary care practices are the domain subject of study, not integrated care services. Considering the need for integrated care and chronic care improvement, the further development of these or new models for guiding improvements in integrated care with their specific characteristics and context factors is crucial.

Chapter 5 describes our study, which aimed to identify the elements and clusters of a quality management model for integrated care. A combination of three methods was applied. First, a literature study was conducted which identified 101 elements of integrated care. Next an expert panel of 31 experts with experience working in research or integrated care programmes participated in a Delphi study. The experts commented and prioritised 175 elements in three rounds. In a session with the expert panel, Concept Mapping was used to cluster the elements, position them on a map and analyse their content. Multidimensional statistical analyses were applied to design the model. Based on criteria for inclusion and exclusion, 89 unique elements were determined after the three Delphi rounds. By using Concept Mapping the 89 elements were grouped into nine clusters. The clusters were labelled: 'Quality care', 'Performance management', 'Inter-professional teamwork', 'Delivery system', 'Roles and tasks', 'Patient-centeredness', 'Commitment', 'Transparent entrepreneurship' and 'Result-focused learning'. The elements and clusters identified provide a basis for a comprehensive quality management model for integrated care. This model differs from other quality management models with respect to its general approach towards multiple patient categories and its broad definition of integrated care, ranging from acute to palliative care. The model furthermore highlights conditions for effective collaboration such as commitment, clear roles and tasks and entrepreneurship. For integrated care practices, the model could serve as a basis for self or external evaluation of the integrated care service and provide inspiration for further improvement. The model also addresses nine interesting themes (the clusters) for further research on integrated care. For policy goals, the model could be used as a set of 'organisational' performance measures that can help in monitoring and stimulating balanced integrated care improvement.

In **chapter 6** a survey study on the developmental processes over time in integrated care is described. Although there are many integrated care programmes worldwide, the process of taking integrated care to higher levels is described to only a limited extent in the literature and largely remains a black box. The purpose of our study was to explore how local integrated care services are developed in the Netherlands, and to conceptualise and operationalize a development model for integrated care. The research is based on an expert panel study followed by a two-part questionnaire. Essential elements of integrated care, which were developed in the previous Delphi and Concept Mapping study, were analysed in relation to the development process of integrated care. The study showed that integrated care development can be characterised by four developmental phases with different emphases that change over time. These phases were the initiative and design phase; the experimental and execution phase; the expansion and monitoring phase; and the consolidation and transformation phase. The results showed that in each of the phases different elements of integrated care could be identified as the most important ones. Overall the findings provided a descriptive model of the development process that integrated care services can undergo in the Netherlands. The study has important implications for integrated care services, which can use the model as an instrument to reflect on their current practices and identify improvement areas fitting their phase of development. Moreover, the model provides a framework for evaluation designs for integrated care arrangements. To further assess the model's value, empirical validation of our findings in practice is an important next step. Another interesting opportunity is to expand the use of the model and our findings internationally.

Chapter 7 presents an empirical validation study of the 89 elements and nine clusters of the Development Model for Integrated Care (DMIC) in integrated care practice. Based on the DMIC, a survey was developed for integrated care coordinators of three integrated care service settings in the Netherlands : stroke, acute myocardial infarct (AMI), and dementia. The selection of these three groups was based on the desired variance in client groups, the care providers involved and the years of integration to assess the generalizability of the model. The availability of national collaborative networks of integrated care services like the National Stroke Service Network was a further criterion for stimulating participation. The survey focused on the relevance, implementation and plans of the elements in integrated care practices. 84 integrated care services – 32 stroke, nine AMI and 43 dementia services – and their coordinators participated in the study. The results indicate that the elements of the DMIC were rated as highly relevant in all three care settings. Although the dementia networks did not go back nearly as far, the numbers of implemented elements were comparable to those in the other services, indicating a large amount of activity in recent years. For the total group, the mean percentages of implemented elements were the highest in the 'inter-professional teamwork' and in the 'roles and tasks' clusters, while the lowest percentages were found in the 'quality care' and 'performance management' clusters. Timeline analyses showed that the older integrated care services had fewer plans for further implementation than the younger ones, as was presumed by the model. The number of planned elements told us that the integrated care services are still developing, although the intensity differs significantly. Integrated care coordinators found that the DMIC helped them assess their integrated care and supported them in obtaining ideas for expanding their integrated care activities. Although the client groups and the characteristics of the 84 participating integrated care services differed considerably, the results confirm that the clusters and the vast majority of DMIC elements are relevant to all three groups. Support was therefore found for the conclusion that the DMIC's elements and clusters can serve as a basis for a generic quality management tool for integrated care.

In **Chapter 8** the four phases of the DMIC have been validated in integrated care practices. Based on our previous studies of the DMIC, a survey was developed for integrated care coordinators. The study was performed in 84 stroke, AMI and dementia services in the Netherlands. Data were collected on integrated care characteristics, planned and implemented integrated care elements, self-assessed development phases and factors that influence the development of the integrated care services. All 84 participating integrated care services positioned themselves in one of the four phases and confirmed the phase descriptions. Of these 93% confirmed that they recognised earlier phases and had gone through the previous phase. The study provided support for a presumption of the four-phase model that the number of implemented elements would increase between each of the phases (and decrease for planned elements). The correlation between implemented relevant elements and the self-assessed phase was substantially lower than the correlation with phases as calculated on the basis of the DMIC. This indicates that the self-assessment of development phases would appear to be complex, while the DMIC can be supportive in calculating the development phase of integrated care services. The study also showed that elements corresponding to the earlier phases of the model were on average older, which indicates a certain pattern in development over time. Although the integrated care services were all very different, the DMIC development phases were confirmed. This shows that integrated care development is characterised by a changing focus over time in each phase, often starting with the drawing up of numerous plans for the near term. Integrated care coordinators experienced the DMIC as helpful for the evaluation and further guidance of their integrated care. We concluded that the four phases add value to the empirically validated DMIC model with its 89 elements and nine clusters, and has the potential to serve as a generic quality management tool for multiple integrated care settings.

The **general discussion** presents and discusses the main findings of our studies. The studies in this thesis show that the improvement and development process of integrated care is a long-term, multi-component process in which integrated care services cover a large range of activities. Quality management models are not frequently used in integrated care improvement and although there are many integrated care programmes, an evidence-based generic quality management model for integrated care was lacking. In addition, a generic set of elements that are crucial for integrated care was not available. The 89 elements of integrated care as identified in this study, grouped into nine clusters, show that integrated care services do have generic components. Multiple aspects influence the dynamics and developmental process of integrated care services over time, but overall these processes can be conceptualised as phase-wise growth. Our study identified four phases. The elements, clusters and four phases together formed the Development Model for Integrated Care (DMIC). The model bears a resemblance to components of existing quality management models like the EFQM/MBQA models and the CCM, but has a wider focus on effective collaboration, commitment, learning, roles and tasks and entrepreneurship. Also it has a generic scope ranging from acute to chronic care. Another difference is the four development phases, which reflect the dynamics of integrated care. The DMIC was successfully validated in integrated stroke, AMI and dementia practices despite differences in client groups, size, focus, and the care providers involved. An overview on the 84 cases studied showed that there is a large variation between practices with regard to development phase and the number of elements that have been implemented. Phase-wise thinking is relatively new, but there is a certain order in practice which corresponds to our phases when elements are taken up. The variation found in practice regarding development and implementation is also the case when services are of the same 'age' and have the same contextual factors like legislation or financing. This shows that integrated care services have the opportunity to take up the challenge themselves.

Our study results and the DMIC have a number of implications for practice, policy and further research. For integrated care practices (coordinators, professionals and managers) the DMIC can be useful in assessing the current situation and guiding further improvement. The DMIC now forms the basis for a recently developed web-based self-assessment tool. When multiple participants use the tool in their integrated care service, consensus scores and improvement areas can be revealed, resulting in clarity about possible interventions appropriate to the particular phase of development. Future research needs to address the further assessment of the generic character of the DMIC. New studies show that the DMIC is also relevant for diabetes care and palliative networks, but more research on applying the DMIC within other client groups and for patients with multi-morbidities is recommended. Another suggestion would be the application of the DMIC in other countries to assess the international relevance. Two studies in Canada that are using the DMIC are initiated now and there is already some interest in other countries, but more studies are needed. Lastly, we did reveal some of the dynamics of integrated care development but research on contextual and human factors (e.g. social relations, cultures, interests and power) would add value.

For policy-makers and financers this thesis provides information on stimulating the further development of integrated care. In a recent pilot study with a health insurance company it is studied whether the DMIC can be supportive in purchasing integrated care. Another important issue for practice, policy and research is attention to the relationship between the organisation of integrated care, costs and its results. The aim of integrated care is after all to contribute to reducing fragmentation and to better outcomes, efficiency and costs. It seems plausible that further developed integrated care practices deliver better results, but evidence is needed. With the expansion of costs and the growing numbers of elderly and chronically (multi-morbid) patients, the question how to best and cost-effective organise our care is the main challenge in this decade. Now it is up to all stakeholders to contribute to effective integrated care so that we all feel supported in life when we need it the most.

Samenvatting

Dit proefschrift gaat over de vraag wat de essentiële elementen van ketenzorg zijn en over hoe implementatie en ontwikkeling van ketens in de zorg verloopt, om te komen tot een kwaliteitsmanagementmodel voor ketenzorg. Ketenzorg is nodig als de behoeften van cliënten of patiënten de mogelijkheden van een enkele professional of zorgorganisatie overstijgen en er een gecoördineerd aanbod van zorg nodig is. De resultaten van de studies in dit proefschrift komen samen in het OntwikkelingsModel voor Ketenzorg, afgekort het OMK.

Hoofdstuk 2 beschrijft een studie over de implementatie van CVA-ketenzorg, oftewel zorg voor mensen met een beroerte. In veel samenlevingen die te maken hebben met vergrijzing, zijn beroertes een belangrijke doodsoorzaak en gaan zij samen met veel langdurende beperkingen in de gezondheid van mensen en met hoge kosten. Bij CVA-ketenzorg zijn veel verschillende disciplines en organisaties in de zorg betrokken zoals huisartsen, ziekenhuizen, revalidatiecentra, verpleeghuizen en thuiszorgaanbieders. Onze studie beschrijft een verbeterprogramma voor CVA-zorg dat van start ging omdat ondanks de aanwezige goede voorbeelden, 'best practices', richtlijnen en kwaliteitscriteria voor CVA-ketenzorg, CVA-ketens deze niet voldoende benutte om aanzienlijke verbeterslagen te maken. Aan het gestructureerde verbeterprogramma deden 23 CVA-ketens mee in twee groepen; zij vertegenwoordigden in totaal circa 140 zorgorganisaties. De CVA-ketens stelden multidisciplinaire verbeterteams samen, stelden hun knelpunten vast, formuleerden ongeveer zes tot zeven verbeterdoelen, gebruikten de methode van kort-cyclisch verbeteren en analyseerden hun eigen resultaten. De onderwerpen waar de meeste verbeteringen zich op richtten waren het verkorten van opnameduur en betere patiëntenlogistiek, uitwisseling en overdracht van informatie tussen zorgverleners, het inrichten van nazorgtrajecten en de invoering van trombolyse behandelingen. Om de mate van verbetering vast te stellen is een vijf punts Likert schaal gebruikt waarbij 1 stond voor 'geen activiteit' en 5 voor 'aanzienlijke verbetering'. 78% van de deelnemende teams verbeterde hun CVA-keten significant op ten minste één onderwerp. 34% slaagde erin om op al hun gestelde doelen significante verbeteringen te realiseren. Het onderzoek liet zien dat het gestructureerde verbeterprogramma werkte als een katalysator voor de deelnemende ketens. De stapsgewijze methodiek, de ondersteuning door externen, de tijdsdruk en de focus op meetbare resultaten stimuleerden om daadwerkelijk tot samenwerking en verbetering te komen binnen de complexiteit van een keten. Veel deelnemende teams ondervonden dat de samenwerking tussen de diverse spelers in de keten verbeterde en dat het bewustzijn deel uit te maken van een keten toenam. Hoewel de ketenzorg aantoonbaar verbeterde, is het voor het doen van uitspraken over de bereikte resultaten in de ketens van belang dat ook uitkomsten op cliëntniveau (zoals tevredenheid, gezondheid en patiëntenlogistiek zoals wachttijden) gemeten en bestudeerd worden.

In **hoofdstuk drie** wordt een multiple casestudy in acht regionale dementie ketens beschreven. Het aantal mensen met dementie in Nederland neemt snel toe. Deze mensen hebben behoefte aan een gevarieerd pallet van zorg en ondersteuning hetgeen integrale ketenzorg nodig maakt, ook om zo lang mogelijk in de eigen omgeving te kunnen blijven wonen. Het onderzoek beschrijft en analyseert een intensief casemanagement model als een onderdeel van dementie ketenzorg in Nederland. Op basis van een literatuurstudie is een vragenlijst ontwikkeld die als een basis diende voor 16 semi-gestructureerde interviews met de casemanagers en managers van de acht dementieketens. Projectdocumentatie van alle cases is bestudeerd. Onze studie liet zien dat ondanks het feit dat de acht casemanagement programma's in verschillende delen van het land en onafhankelijk van elkaar zijn ontwikkeld, er overeenkomsten in de opzet en de aanpak zijn. Dit betreft de visie op het casemanagement, de taken van case managers, het case management proces en de deelnemende spelers in de dementieketen. Verschillen zijn gevonden in de doelgroep, de achtergronden van de casemanagers en hun positie in de regionale dementieketen. Succesfactoren voor implementatie waren de expertise van de casemanagers, een sterk netwerk van zorgaanbieders, en de juiste condities voor interorganisationele samenwerking in de keten. De casemanagers zijn voorstander van een model dat een breed spectrum aan taken bevat en vinden verbondenheid aan een multidisciplinair team en/of artsen een voordeel. De case management programma's hadden (nog) geen uitkomsten verzameld over resultaten zoals zorggebruik en kosten. Als de tevredenheid van cliënten en hun naasten was gemeten, was deze hoog. De studie laat zien dat de case managers overtuigd zijn van de toegevoegde waarde van het case management om zorg op maat te kunnen leveren aan complexe groepen zoals mensen met dementie. De implementatie van duurzaam case management is echter complex en tijdrovend door de veelheid aan betrokken zorgverleners en organisaties die allen verschillende belangen hebben en door de uiteenlopende vormen van financiering. Om de implementatie te bevorderen is het noodzakelijk dat er een gezamenlijke verantwoordelijkheid van de betrokkenen is naast incentives voor gezamenlijke contracten tussen de zorgaanbieders en de financiers zoals zorgverzekeraars.

In **hoofdstuk vier** wordt een literatuurstudie naar het bewijs van betere resultaten in de zorg door het gebruik van kwaliteitsmanagement modellen en hierop gebaseerde interventies beschreven.

Om de implementatie van ketenzorg te bevorderen, kunnen diverse kwaliteitsmodellen gebruikt worden. Het model van de European Foundation Quality Management Excellence (EFQM), de Malcolm Baldrige Quality Award (MBQA), en het Chronic Care Model (CCM), zijn internationale en veelgebruikte modellen met zorgspecifieke versies en met veronderstelde of bewezen relaties tussen de componenten van het model en betere resultaten in de zorg. Er is een systematische literatuurstudie van 1995 tot mei 2006 in de Pubmed, Cochrane en ABI database uitgevoerd. Er werden 37 studies geïncludeerd waarvan 16 in de Excellence Award Model search en 21 in de Chronic Care Model search. Er zijn gegevens verzameld over de belangrijkste interventies, de studiedesigns, de mate van bewijs, de setting, de contextfactoren, de manier van dataverzameling en analyse, de resultaten en de genoemde uitkomstdimensies. Er zijn geen Excellence Award Model studies gevonden met gecontroleerde designs. In de Chronic Care Model Search zijn één meta analyse, één systematische review en zes gecontroleerde studies geïncludeerd. 17 studies (2 Excellence Award Model, 15 Chronic Care Model) rapporteerden één of meer significante resultaten. Er is een groeiend bewijs dat het implementeren van interventies gebaseerd op het evidence-based Chronic Care Model uitkomsten op proces- of uitkomstniveau kan verbeteren. Het bewijs voor betere resultaten door interventies gebaseerd op het expert-based Malcolm Baldrige Quality Award criteria en het European Foundation Quality Management model is beperkter.

Slechts enkele studies bevatten een gebalanceerde set met indicatoren op meerdere resultaat-dimensies. In veel studies zijn echter zorgorganisaties zoals ziekenhuizen of huisartsenpraktijken het onderwerp van onderzoek, niet een keten. Gezien de groeiende behoefte aan integrale ketenzorg voor het toenemend aantal ouderen en chronisch zieken, is het ontwerpen of verder ontwikkelen van modellen die ketenontwikkeling met zijn specifieke kenmerken en contextfactoren kunnen richten cruciaal.

Hoofdstuk vijf beschrijft een studie die tot doel heeft het identificeren van de elementen en clusters van een kwaliteitsmanagement model voor ketenzorg. Er zijn drie onderzoeksmethoden gecombineerd. Als eerste is een literatuurstudie uitgevoerd waarin 101 elementen van ketenzorg zijn geïdentificeerd. Daarna is een expertpanel met 31 experts met ervaring in de praktijk, het beleid of onderzoek in ketenzorg samengesteld die deelnamen aan een Delphi studie. De experts becommentarieerden en prioriteerden 175 elementen in drie rondes. In een bijeenkomst met het expertpanel is Concept Mapping gebruikt om de elementen te clusteren, ze te plaatsen op een "kaart" en de inhoud te analyseren. Bij het ontwerp van het model zijn multidimensionale statistische analyses ingezet. Gebaseerd op criteria voor in- en exclusie zijn 89 unieke elementen vastgesteld in drie ronden. Met behulp van Concept Mapping zijn de 89 elementen gegroepeerd in negen clusters. De clusters heten 'optimale zorg', 'resultaatsmanagement', inter-professionele samenwerking voor doelgroepen', 'ketenregie- en logistiek', 'rollen en taken', 'cliëntgerichtheid', 'ketencommitment', 'transparant ondernemerschap' en 'resultaatgericht leren'. De geïdentificeerde elementen en clusters vormen de basis voor een kwaliteitsmanagement model voor ketenzorg. Het model verschilt van andere modellen door zijn generieke karakter gericht op meerdere patiëntengroepen en zijn brede definitie van ketenzorg, van acute tot aan palliatieve zorg . Daarnaast legt het model meer nadruk op de condities voor effectieve samenwerking zoals commitment, heldere rollen en taken en ondernemerschap. Voor de praktijk van ketenzorg kan het model dienen als een basis voor zelf- of externe evaluatie van de keten en als inspiratiebron voor verdere verbetering. Het model kan tevens dienen als een kader voor verder onderzoek naar elk van de thema's van de negen clusters. Voor beleidsdoelstellingen kan het model gebruikt worden als een set van "organisatorische indicatoren" die behulpzaam kunnen zijn voor het monitoren en stimuleren van een gebalanceerde verbetering van ketenzorg.

In **hoofdstuk zes** wordt een onderzoek met vragenlijsten beschreven naar het ontwikkelingsproces van ketenzorg in de tijd. Hoewel er wereldwijd veel ketenzorgprogramma's zijn gelanceerd, is het proces om ketenzorg naar een hoger niveau te tillen maar in beperkte mate in de literatuur beschreven en nog grotendeels een "black box". Het doel van onze studie is om te onderzoeken hoe Nederlandse zorgketens zich ontwikkelen in de tijd en om een ontwikkelingsmodel voor ketenzorg te conceptualiseren en operationaliseren. Het onderzoek is gebaseerd op een expertpanel studie gevolgd door een vragenlijstonderzoek bestaande uit twee delen. De essentiële elementen van ketenzorg die waren ontwikkeld in de voorgaande Delphi en Concept Mapping studie zijn geanalyseerd in relatie tot het ontwikkelingsproces van ketenzorg. Het onderzoek toonde aan dat de ontwikkeling van ketenzorg gekarakteriseerd kan worden door vier fasen van ontwikkeling met verschillende accenten die veranderen gedurende de tijd. De fasen heten 'de initiatief- en ontwerpfase', 'de experiment- en uitvoeringsfase', 'de uitbouw- en monitoringsfase' en de ' verduurzamings- en transformatiefase'. De resultaten tonen aan dat in elk van de fasen andere elementen van ketenzorg de meest belangrijke zijn. De resultaten laten zo een descriptief model zien van het ontwikkelingsproces dat zorgketens kunnen ondergaan in Nederland. De studie heeft belangrijke implicaties voor de praktijk van ketenzorg omdat het model te gebruiken is als een instrument om te reflecteren op de huidige fase van ontwikkeling en het identificeren van verbeteringen die passen bij de actuele fase van ontwikkeling. Daarbij voorziet het model ook in een raamwerk voor de designs voor evaluatiestudies op het terrein van ketenzorg. Om de verdere waarde van het model vast te stellen is een belangrijke volgende stap het valideren van het model in de praktijk. Een andere interessante mogelijkheid is het gebruik van het model te vergroten, ook internationaal.

Hoofdstuk zeven presenteert de empirische validatie van de 89 elementen en 9 clusters van het Ontwikkelingsmodel voor Ketenzorg (OMK). Er is een vragenlijst voor ketencoördinatoren gebaseerd op het OMK ontwikkeld voor drie soorten ketens in Nederland : beroerteketens, myocard infarct (AMI) ketens en dementieketens. De selectie van deze drie groepen was gebaseerd op de beoogde variatie in cliëntengroepen, de betrokken zorgaanbieders en het aantal jaren van ketenvorming. Hierdoor kan de algemene toepasbaarheid van het model vastgesteld worden. De aanwezigheid van landelijke netwerken van ketens die het onderzoek steunden, zoals CVA Nederland, bevorderde de deelname. Het vragenlijstonderzoek richtte zich op de relevantie, de implementatie en plannen voor de elementen in de zorgketens. In totaal deden 84 zorgketens (32 beroerte-, 9 AMI- en 43 dementieketens) en hun coördinatoren mee aan de studie. De resultaten laten zien dat de elementen van het OMK in het algemeen werden beoordeeld als zeer relevant in alle drie de settings. De hoogste gemiddelde percentages geïmplementeerde elementen zijn gevonden in de clusters 'inter-professionele samenwerking' en 'rollen en taken', terwijl de laagste percentages gevonden zijn in de clusters 'optimale zorg' en 'resultaatsmanagement'. Analyses van tijdslijnen lieten zien dat de oudere zorgketens minder plannen hadden voor implementatie dan jongere ketens, zoals ook verondersteld wordt door het model. Het aantal geplande elementen laat zien dat zorgketens zich nog steeds ontwikkelen, hoewel de intensiteit van plannen aanzienlijk verschilt. Hoewel de dementieketens aanzienlijk jonger zijn is het aantal geïmplementeerde elementen vergelijkbaar met de andere ketens. Dat laat zien dat er veel ontwikkeling is geweest de afgelopen jaren. Ketencoördinatoren vonden de vragenlijst met als basis het OMK een nuttig instrument om hun eigen keten te analyseren en om ideeën te generen voor de verdere ontwikkeling van de keten. Hoewel de cliëntengroep en de kenmerken van de 84 deelnemende ketens aanzienlijk verschilden, toonden de resultaten dat de clusters en de grote meerderheid van de OMK elementen als basis kunnen dienen voor een generiek kwaliteitsmanagement model voor ketenzorg.

In **hoofdstuk 8** zijn de vier fasen van het OMK gevalideerd in de praktijk. Gebaseerd op de voorgaande studie over het OMK is een vragenlijst voor ketencoordinatoren ontwikkeld. De studie is uitgevoerd in 84 beroerte-, myocard- en dementieketens in Nederland. De dataverzameling richtte zich op de kenmerken van de ketens, het aantal geplande en geïmplementeerde elementen, factoren die de ontwikkeling van de keten beïnvloeden en een zelfinschatting van de fase waarin de eigen keten zich bevindt. Alle 84 ketens bevestigden de beschrijvingen van de vier fasen en positioneerden zichzelf in één daarvan. Van de ketens bevestigden 93% dat zij eerdere fasen herkenden en hadden doorlopen. De studie bevestigt de aanname dat het aantal geïmplementeerde elementen toeneemt (en het aantal geplande elementen afneemt) tussen iedere opeenvolgende fase in het model. De correlatie tussen het aantal geïmplementeerde relevante elementen en de eigen fase- inschatting was aanzienlijk lager dan de correlatie met de fasen zoals gecalculeerd op basis van het OMK. Dit laat zien dat het maken van een eigen fase-inschatting complex is en het OMK behulpzaam kan zijn bij het bepalen van de ontwikkelingsfase in ketenzorg. Het onderzoek laat zien dat elementen die bij eerdere fasen horen, in de praktijk ook ouder bleken te zijn hetgeen een indicatie geeft dat een bepaald ontwikkelingspatroon door de tijd wordt gevolgd. Hoewel de ketens allemaal erg verschillend zijn, bevestigden zij de ontwikkelingsfasen van het OMK model. Dit laat zien dat de ontwikkeling van ketenzorg gekarakteriseerd wordt door een verschuivende focus gedurende de tijd in iedere fase, waarbij men vaak start met vele plannen voor de korte termijn. Ketencoördinatoren beoordeelden het OMK als behulpzaam voor de evaluatie en verdere ontwikkeling van hun keten. We concluderen dat het empirisch gevalideerd onderscheid in vier fasen een versterking oplevert van het OMK model met zijn 89 elementen en 9 clusters. Het uiteindelijke model heeft de potentie om te dienen als een generiek kwaliteitsmanagement model voor ketenzorg.

In het **discussiehoofdstuk** presenteren en bediscussiëren we de hoofdresultaten van onze studies. Dit proefschrift laat zien dat het verbeteren en ontwikkelen van ketenzorg een langdurend en uit veel aspecten bestaand proces is waarin ketens een grote hoeveelheid aan activiteiten ondernemen. Kwaliteitsmanagement modellen worden niet vaak gebruikt bij de verbetering van ketenzorg en alhoewel er veel ketenzorg programma's zijn ontbreekt een 'evidence based' generiek kwaliteitsmanagement model voor ketenzorg. Eveneens mist een generieke set van elementen die cruciaal zijn voor ketenzorg. De in dit onderzoek geïdentificeerde 89 elementen van ketenzorg die zijn gegroepeerd in 9 clusters laten zien dat zorgketens generieke componenten hebben. Veel aspecten beïnvloeden de dynamiek en het ontwikkelingsproces van ketens door de tijd, maar overal kunnen deze processen geconceptualiseerd worden als fasegewijze groei. Onze studie identificeerde vier fasen. De elementen, clusters en fasen vormen samen het Ontwikkelingsmodel voor Ketenzorg. Het model heeft overeenkomsten met bestaande kwaliteitsmanagement modellen zoals het EFQM/MBQA model en het CCM, maar legt meer nadruk op effectieve samenwerking, commitment, leren, rollen en taken en ondernemerschap. Ook heeft het een generieke scope van acute tot chronische zorg. Het OMK is succesvol gevalideerd in ketens voor beroerte-, dementie- en myocard infarct patiënten ondanks de verschillen in cliëntengroep, grootte, focus en de betrokken zorgverleners. Een overzicht van de 84 ketens laat zien dat er veel variatie is in de ontwikkelingsfasen en het aantal geïmplementeerde elementen. Het denken in ontwikkelingsfasen van ketenzorg is relatief nieuw, maar in de praktijk is er wel een bepaalde volgorde van ondernomen activiteiten die corresponderen met onze fasen. De grote variatie die we in de praktijk aantroffen betreft ook ketens van dezelfde leeftijd en met dezelfde (macro)contextuele factoren zoals wetgeving en financiering. Dit laat zien dat ketens zelf veel kunnen bereiken door de handschoenen op te pakken.

Dit onderzoek en het OMK hebben diverse implicaties voor de praktijk, beleid en de wetenschap. Voor werkers in de praktijk van ketenzorg (coördinatoren, professionals, managers) kan het OMK behulpzaam zijn om de huidige situatie en ontwikkeling in kaart te brengen en richting te geven aan verdere verbeteringen. Recent is een webbased zelfevaluatie tool gemaakt op basis van het OMK. Wanneer meerdere partners binnen een keten deze tool invullen kan bekeken worden of er onderling consensus bestaat over de ontwikkeling van de gezamenlijke keten en kunnen verbeterpunten inzichtelijk gemaakt worden. Zo kunnen verbeteringen geprioriteerd en opgepakt worden die aansluiten bij de fase van ontwikkeling.

Voor onderzoekers geeft het OMK input als evaluatiekader en benoemt het negen thema's (de clusters) die interessant zijn voor verdiepingsstudies. Vervolgonderzoek zou zich in ieder geval moeten richten op het verder vaststellen van het generieke karakter van het OMK. Nieuwe studies hebben laten zien dat het OMK ook relevant is in de diabeteszorg en voor palliatieve netwerken, maar meer onderzoek met andere cliëntgroepen en bij cliënten met multi moribiditeit is nodig. Een andere aanbeveling is internationaal onderzoek met het OMK. Recent zijn twee studies in Canada geïnitieerd waarbij het OMK wordt ingezet, maar onderzoek in meer landen is van belang. Tenslotte, onze studie gaf inzicht is een bepaald aspect van de dynamiek van ketenzorg, namelijk de ontwikkeling in de tijd. De dynamiek bestaat echter uit meer aspecten zoals de rol van de (maatschappelijke) context, menselijke factoren als sociale relaties, culturen, belangen en macht. Onderzoek naar deze aspecten is interessant en voegt waarde toe. Voor beleidsmakers en financiers geeft dit proefschrift input om de ontwikkeling van ketens verder te stimuleren. Momenteel wordt in een pilotstudie met een zorgverzekeraar onderzocht of het OMK een rol kan spelen in het inkoopbeleid voor ketens.

Een belangrijk punt voor zowel de praktijk, beleid als onderzoek is de relatie tussen de organisatie van ketenzorg en de resultaten en kosten. Het doel van ketenzorg is immers om bij te dragen aan minder fragmentatie, inefficiëntie, meer waar voor het geld en betere resultaten. Het lijkt aannemelijk dat verder of beter ontwikkelde ketens ook betere prestaties leveren, maar stevig bewijs hiervoor ontbreekt nog. Om de stijgende zorgkosten in combinatie met het toenemend aantal ouderen en (multi morbide) chronisch zieken het hoofd te bieden, maakt de vraag hoe onze zorg het beste te organiseren de grootste uitdaging dit decennium. Het is daarom aan alle stakeholders om bij te dragen aan effectieve ketenzorg zodat iedereen die zorg en ondersteuning krijgt in zijn leven wanneer men die het meest nodig heeft.

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Curriculum Vitae

Mirella M.N. Minkman

Mirella Minkman was born in Nijmegen, the Netherlands, on February 15, 1975. In 1993 she graduated from secondary school (Atheneum) at Merlet College in Cuijk. From 1993 to 1997 she studied Nursing at the HAN University of Applied Sciences in Nijmegen, where she graduated in 1997 with a Bachelor's paper about the role of nurses in the organisation of care. In 1997 she started working as a nurse in the Radboud University Nijmegen Medical Center in the departments of ophthalmology and neurosurgery/plastic surgery. She was project leader of a number of quality improvement projects in her department. At the same time (1997) she started her study Health Sciences, Health care Policy and Management at the Maastricht University. In the year 2000 she graduated with a Master's dissertation on professional knowledge for Quality management systems (proposed for the BAZIS price).

After her graduation in 2000, Mirella joined the Dutch Institute for Healthcare Improvement CBO in Utrecht as a junior consultant, where she remained until 2007 (by then a senior consultant). During her time at CBO she worked on and led multiple quality improvement projects in hospitals (advanced access, process improvement), worked with medical specialists (INK-based auditing for radiologists, visitation) and led collaborative Breakthrough Improvement projects (Emergency Departments, Acute and integrated stroke care) and integrated care projects (Stroke, National Dementia Programme). She was the leader of the Innovation team for Integrated care and was responsible for multiple presentations, publications and courses on integrated care and change management. She was the (co) author of multiple books about quality improvement in healthcare and long-term care and also lead author of the books 'The best care for stroke patients'(2005) and 'Continuous improvement. Successful improvement in long term care' (2011).

Since 2007 Mirella has been with Vilans, the National Center for Excellence in long-term care, where she is the head of the Quality and Innovation in Elderly Care programme and the coordinator of the Care for Better programme. In 2005 she started working on her Phd on Integrated Care. Since 2005 she has also been a member of the Supervisory Board of Zorgcentra de Betuwe (focusing on health care policy, quality of care and employment of the CEO), a foundation for care of the elderly in the Betuwe region. Mirella Minkman lives in Tiel together with her partner Remy van Elferen. Together they have two lovely children: Zarah-Lynn (2009) and Quinn-Luuk (2011).

PhD Portfolio

PhD Portfolio

PhD Student: Mirella Miranda Natascha Minkman
Department: Institute of Health Policy and Management
PhD period: 2005-2011
Promotors: Prof.dr. Robbert Huijsman MBA
Prof.dr. ir. Kees Ahaus

PhD training

Training

Study trip to Kaiser Permanente, California, USA	2007
Working visit to the Vancouver Island Health Authority, Canada	2005
Publishing your papers. Academic writing for PhD students, University Utrecht	2005
Various courses on health care, change management and integrated care	2001-now

Presentations

Presentation 'The Development Model for Integrated Care', International Congress on Integrated Care, Odense, Denmark	2011
Workshop 'Organizing effective Integrated Care', International Forum on Quality and Safety in Health care, Nice, France	2010
Workshop: 'Process Improvement in Integrated Care'. Sixth International Congress on Integrated Care, Dublin, Ireland	2005
Presentation: 'Integrated care in the Netherlands: a reflection and approach'. Vancouver Island, Canada	2005

Poster presentation: 'Integrated Stroke Care in the Netherlands'. European Forum on Quality Improvement, London, UK	2005
Presentation: 'Achieving breakthrough results in the improvement of integrated stroke care'. Fifth International Conference on Integrated Care, Birmingham, UK	2004
Presentation 'Spread of knowledge on stroke carein the Netherlands'. International Applied Health Services Research Funders Meeting, New York, USA	2004
Workshop: 'Achieving breakthrough results in the Netherlands'. International Society for Quality in Healthcare, Dallas, USA	2003
Poster and presentation: 'Improving emergency care in the Netherlands'. ISQUA congres, Paris, France	2002
Multiple presentations on national congresses, conferences and meetings	

Teaching qualifications and experience

Lecturing

Management Course 'Grensverleggend management van ketenzorg', programme leader and lecturer	2006-2007
Training 'Kennismaken met ketenzorg', programme leader	2006
University of Leiden, Faculty of Medicine, lecturer	2004-2005
Bachelor and Master's in Health Sciences, University Maastricht, lecturer	2002-2004
Training 'Prestatie-indicatoren en ketenzorg'. Module Geïntegreerde zorg. Netherlands School of Public & Occupational Health, Amsterdam.	2004
Fontys Hogeschool Eindhoven, Applied Nursing Science, lecturer	2002

Supervision of students

S. Ligthart, Master in Health Science, University of Nijmegen	2006

Prizes

Nominated for the BaZis scritpie prijs	2000
Nominated for the TSG 'Innovatie in ketenzorg' prijs	2011

Publications

Mirella M.N. Minkman

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